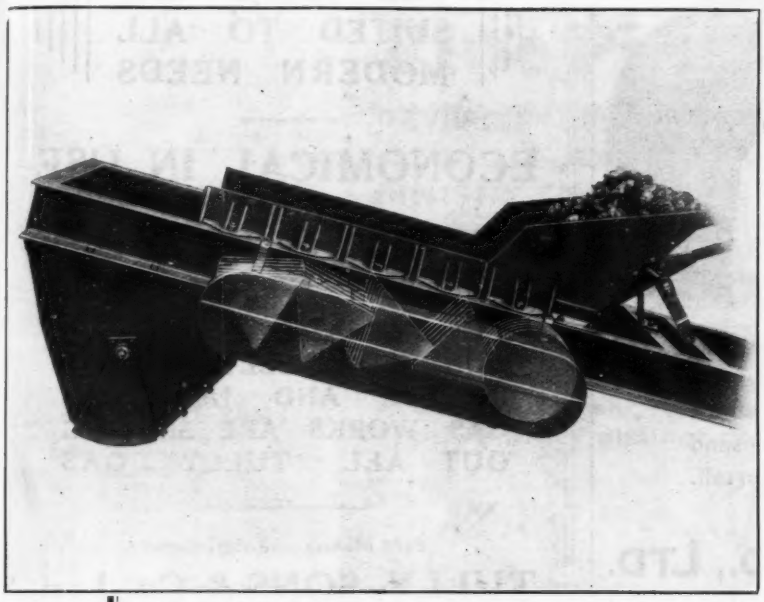
Gas Journal

LIGHT · HEAT · POWER · BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

Vol. 214. 88th Year. LONDON, JUNE 24, 1936. No. 3814. Price 1s.



A typical C.C.L. Debreezer for attachment to a bunker outlet and for bagging duty. The triangular plates are shown in phantom. Operating gear for the feed and discharge valves is not shown.

Descriptive booklet obtainable on application.

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The most efficient coke debreezer.
No vibration.
Low maintenance costs.
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A patented Breeze Return Trough under the triangles enables breeze to be conveyed back and discharged under the feed end without loss of headroom.

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This meter is invaluable to Salesmen for demonstrating the gas consumptions of various appliances such as cookers, fires, boiling burners, etc.

The large dial is carefully and distinctly calibrated. A hinged bezel and movable pointers permit the index to be set at zero when desired. The centre pointer on the outer circle indicates actual consumptions, one complete revolution denoting one cubic foot.

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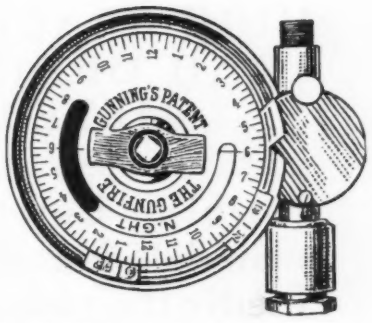

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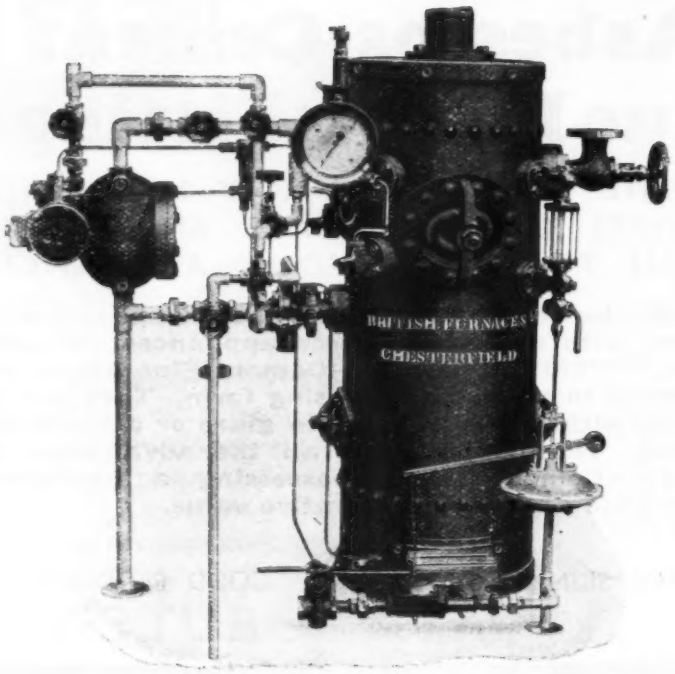

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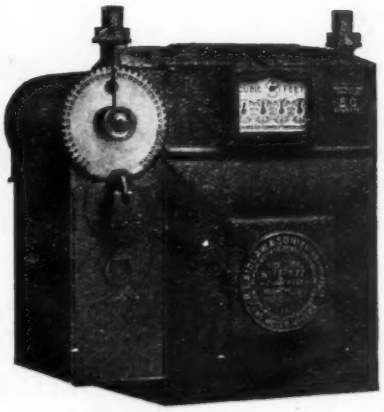

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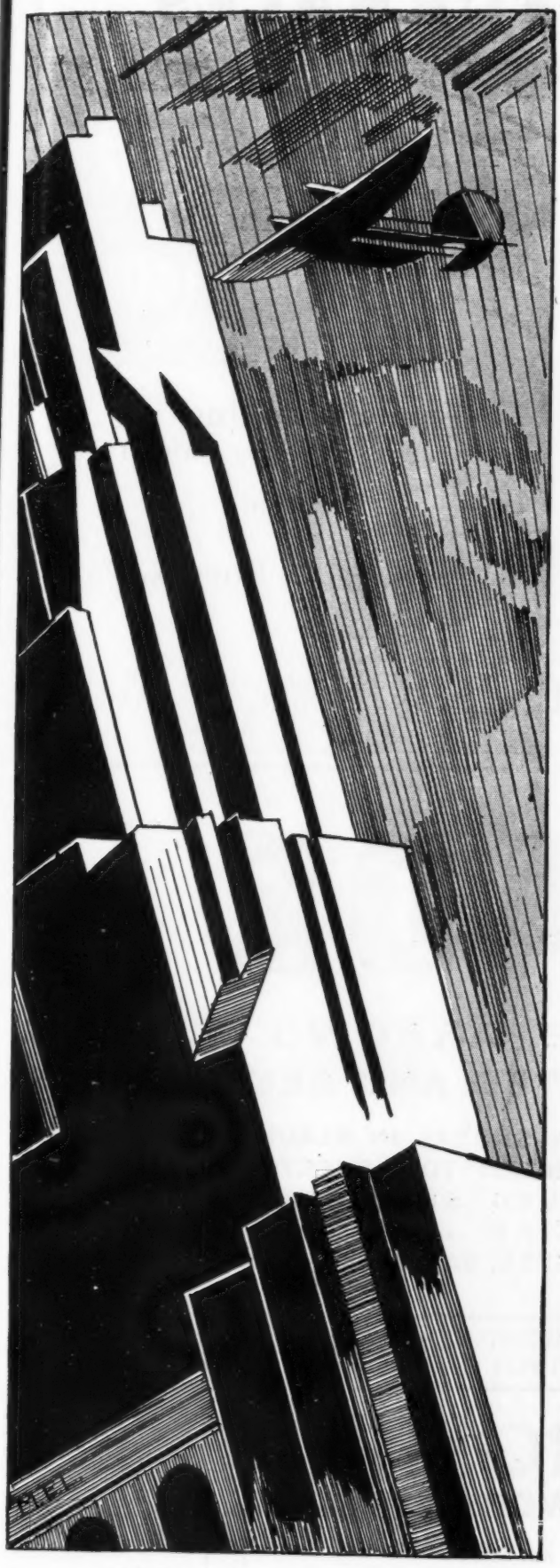

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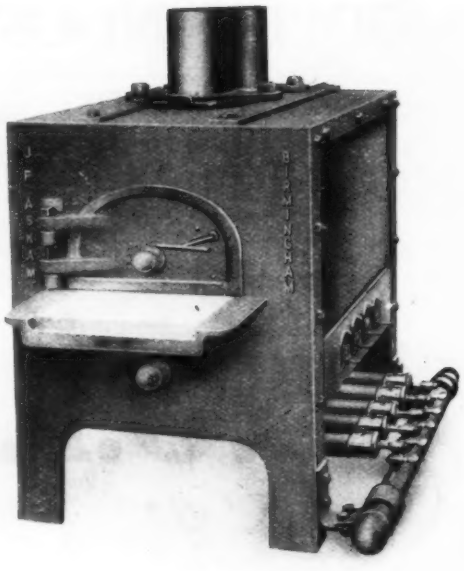

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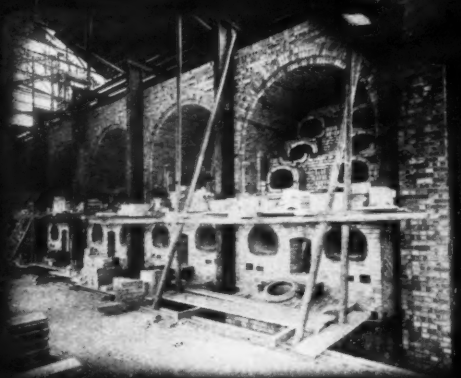

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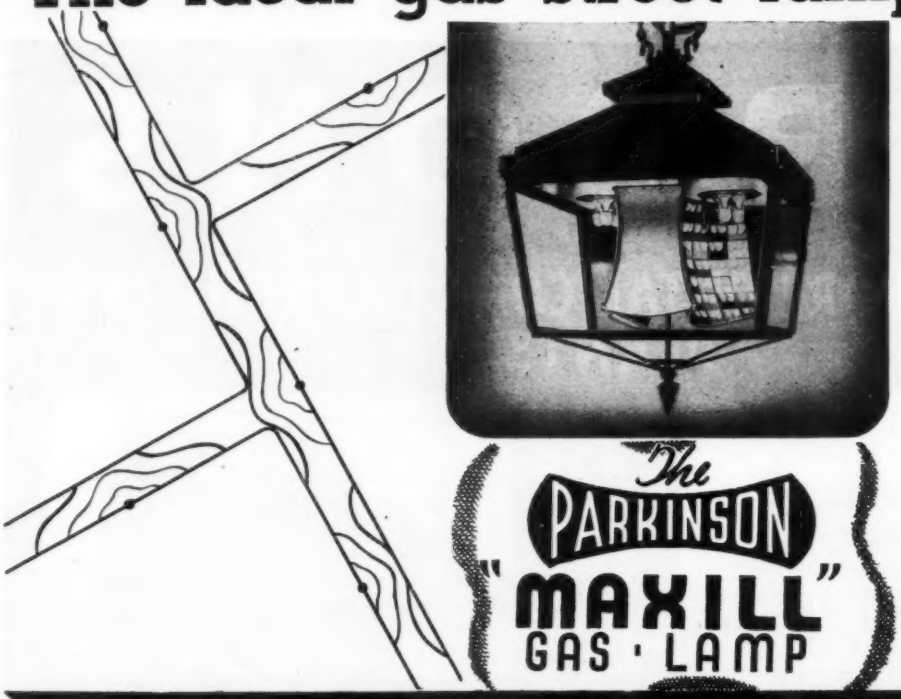

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The PARKINSON "MAXILL" GAS · LAMP

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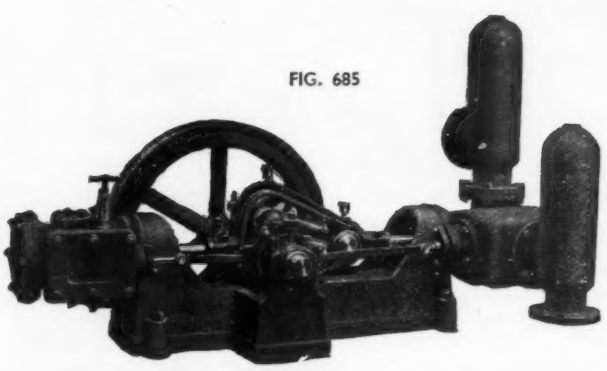

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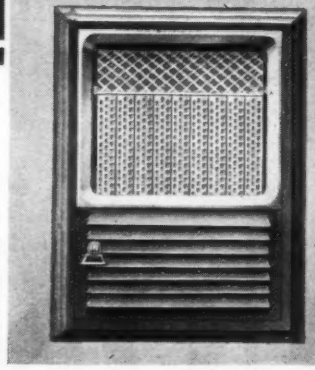

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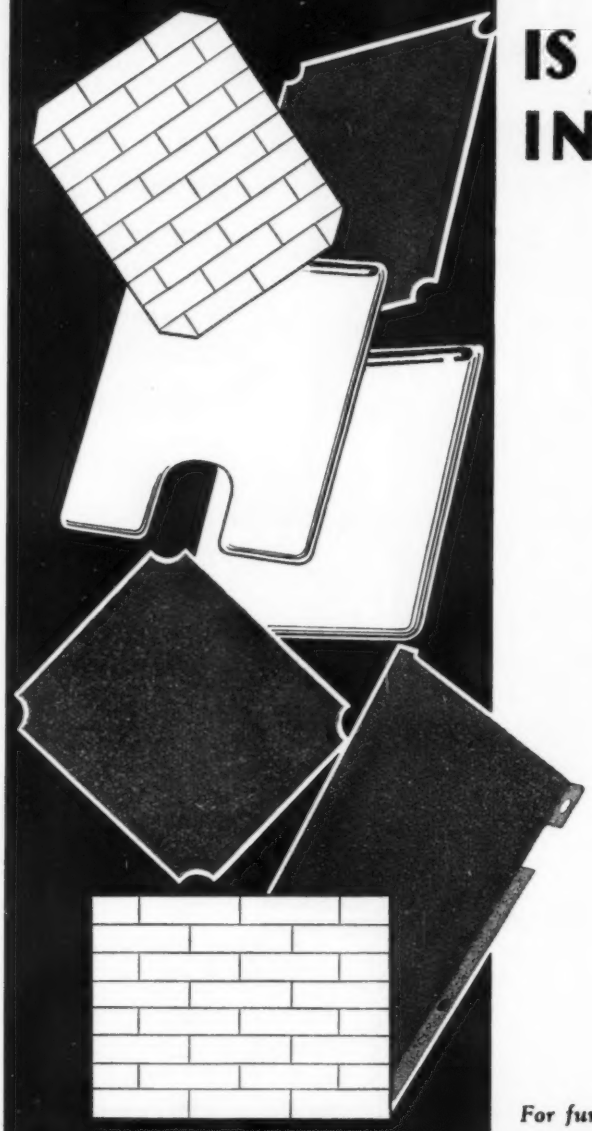

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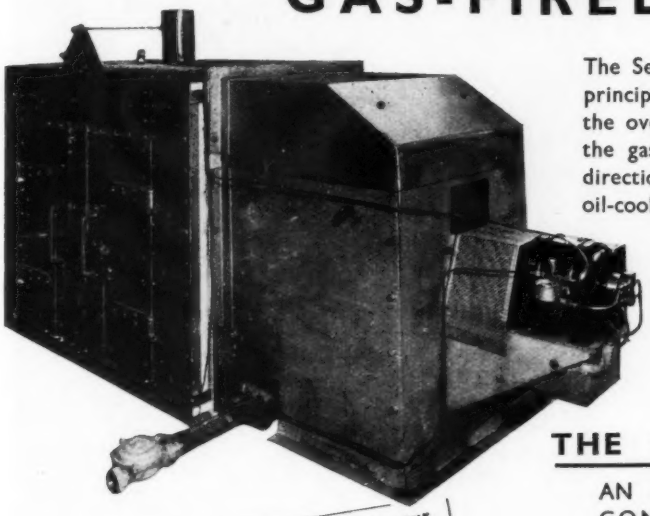

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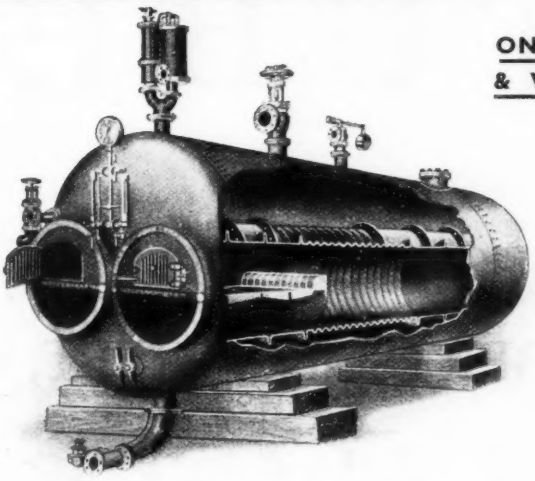

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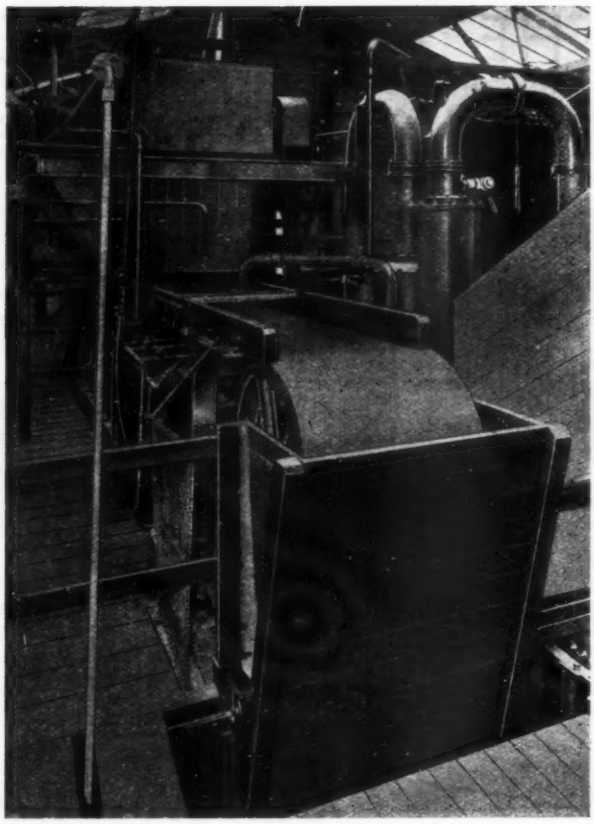

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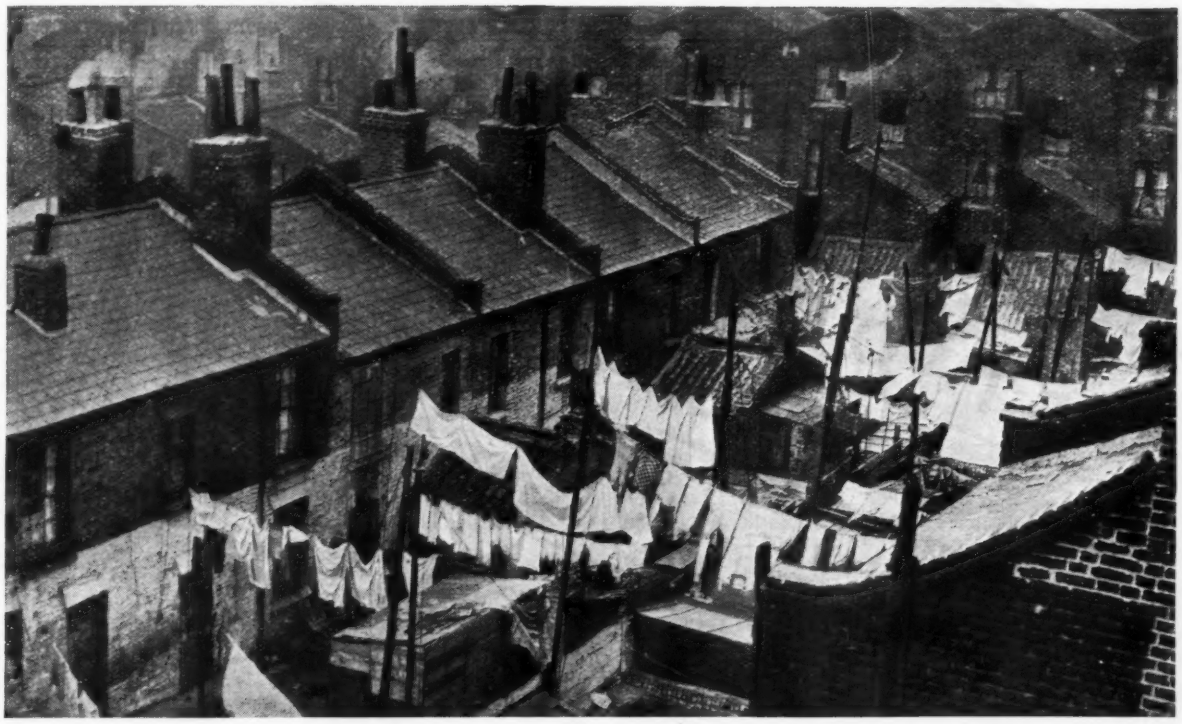

AS Cicero observed, "great is the force of habit." We know "men do more things through habit than through reason." Which may, to some extent, explain the slum. For have we not all heard of the slum dwellers who love their old and dismal homes and fight hard to keep on living in them?

To the more fortunate, the slum habit is perhaps incomprehensible, until we turn the mirror of the mind on to our own thoughts and actions. Then we see the truth of the proverb "Habits are at first cobwebs, at last cables." Do not let us be too hard on those who love their lares et penates, their aspidistras, their what-nots—and—their old gas fires! But at the same time let us do our utmost to get them out of their bad old ways.

The lady who has very definitely left her salad days behind her is sometimes rather cruelly said to be "on the shelf" . . . although perhaps not quite unhopeful of a match!

Many antique gas fires are like that. As to them, we must, like Hamlet, be cruel to be kind . . . they at any rate have missed their chance of a match! Like the philosopher that threw his money into the sea to avoid avarice, we must throw our black monstrosities onto the scrap heap to avoid adding another touch of ugliness to a by no means perfect world . . . in other words, yet more slum clearance!

No one really loved the old gas fire, they put up with it like an ill-tempered relation—disagreeable but sometimes useful. Nous avons changé tout cela with the Portcullis Gas Fire. The Portcullis was the result of Messrs. Bratt Colbran's startling discovery that, in fact, a gas fire can be useful AND charming.

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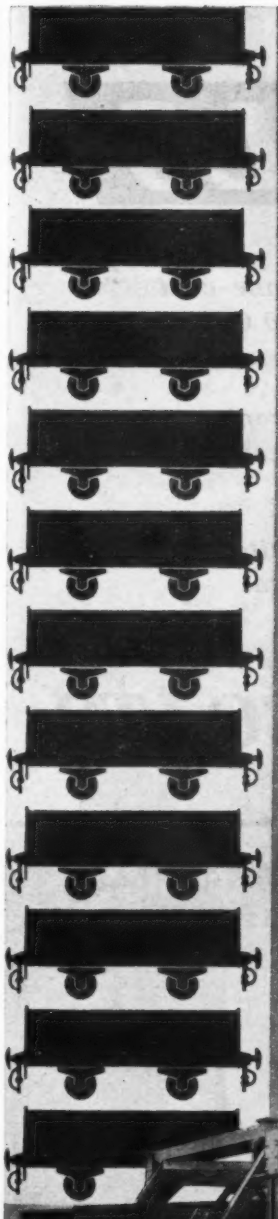

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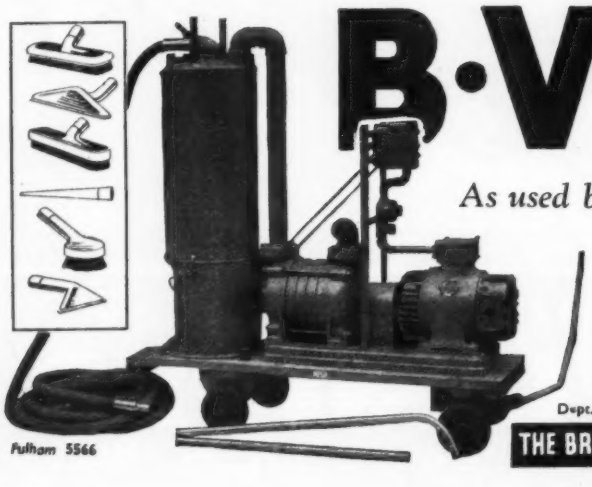

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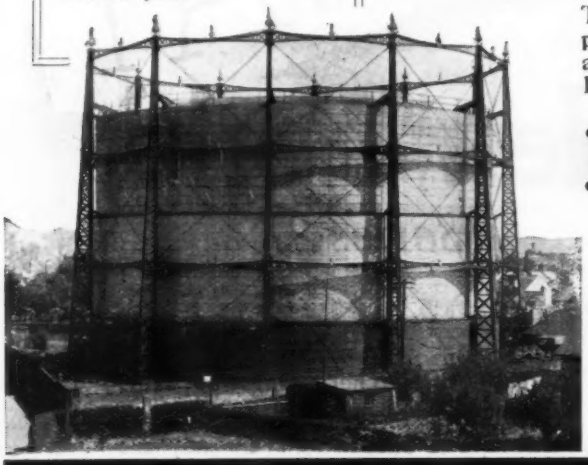

Two years ago Dixon's Paint was selected for protecting a new gasholder at Canterbury Gas Works.

This year, to ensure the best possible protection and appearance on a reconditioned holder, Dixon's Paints were again selected.

The picture shows this holder protected with Dixon's Battle Ship Grey on the outer lift; the middle and top lifts and crown with Dixon's Aluminium-Graphite. The columns and guides are painted with Dixon's Special Foliage Green.

This combination not only gives a very pleasing appearance to a gasholder, but is the best protection against corrosion. MOREOVER, owing to its long life it costs no more than ordinary paint.

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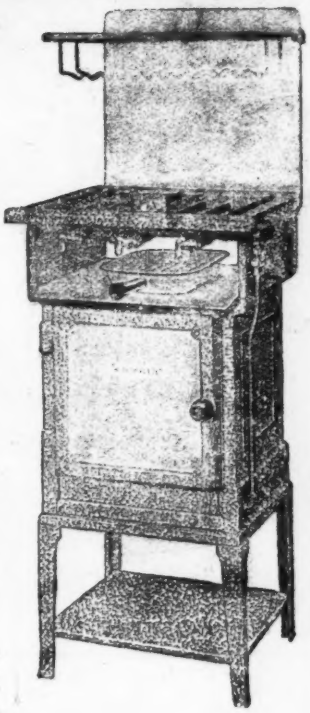

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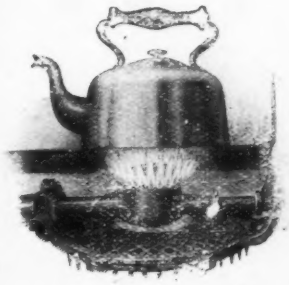

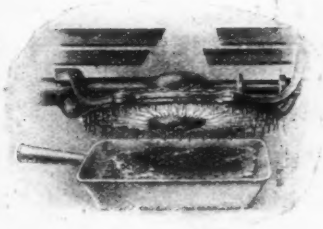

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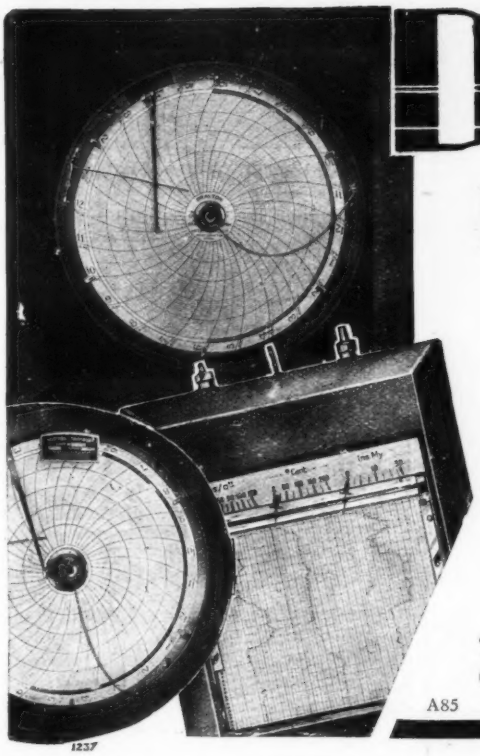

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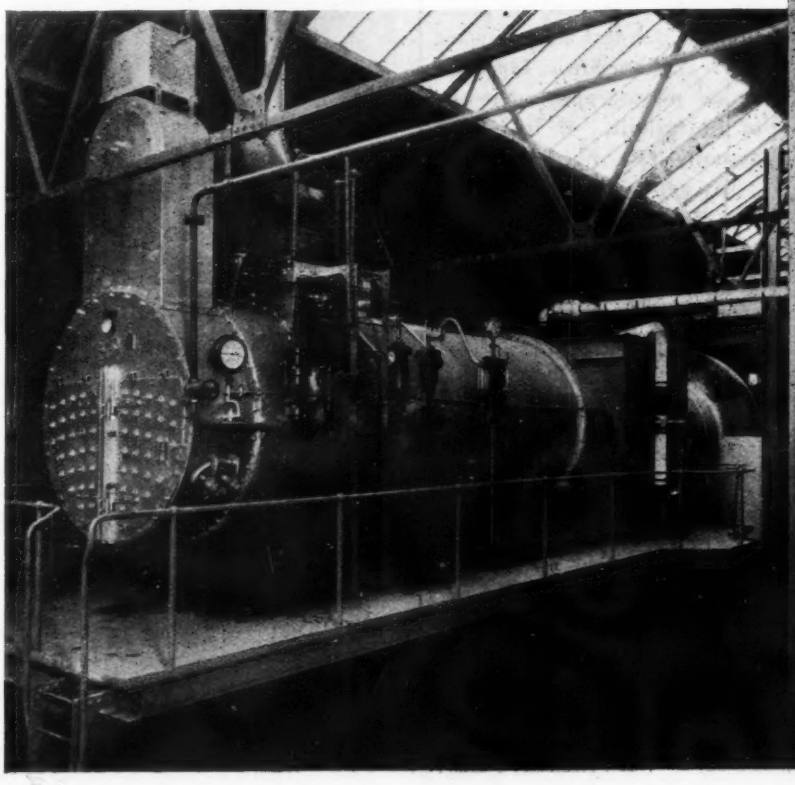

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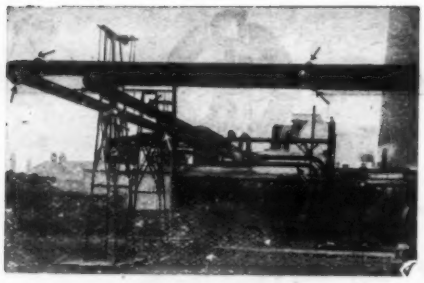

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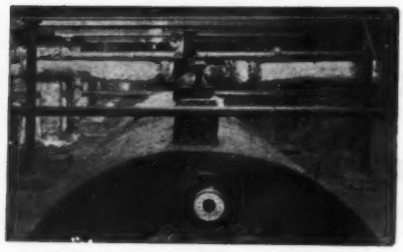
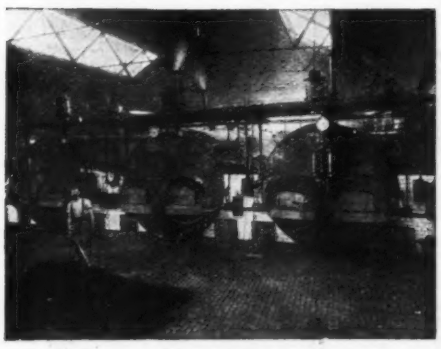
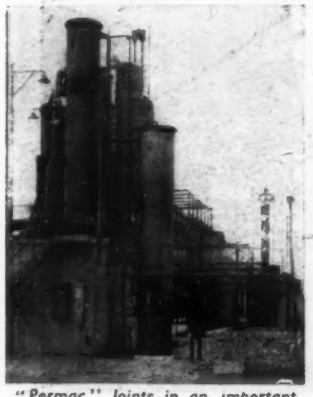


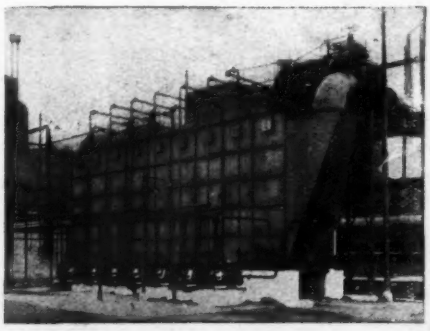
"Permac" Joints on a Lancashire Boiler.



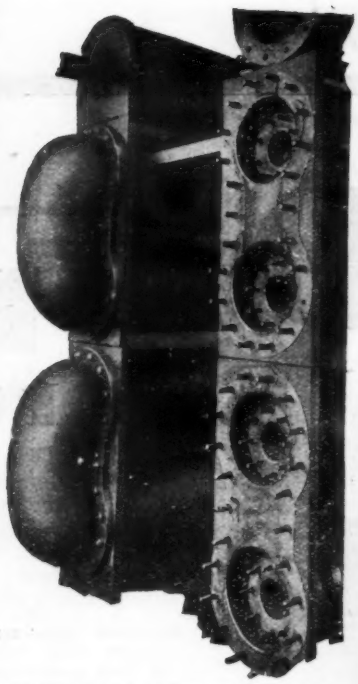
All the Joints in this Boiler House are made with "Permac."



"Permac" Joints in an important London Gas Works.



More "Permac" Joints in a Gas Works.



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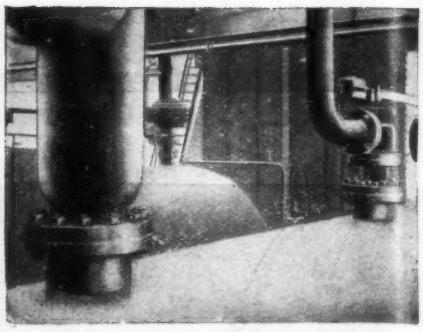
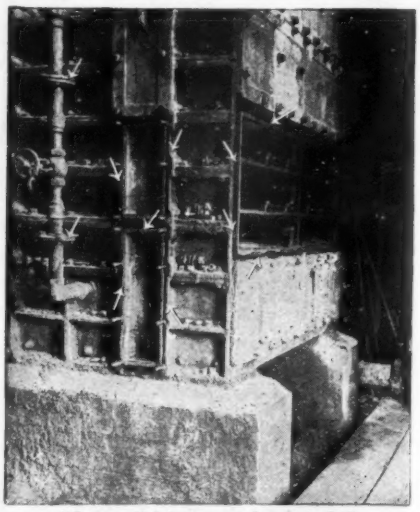


More "Permac" Joints in a Gas Works.



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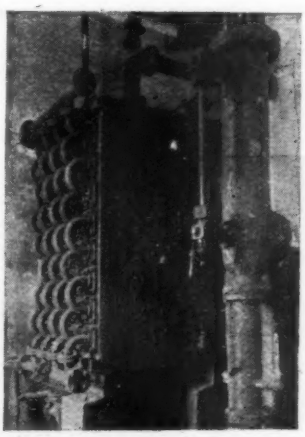
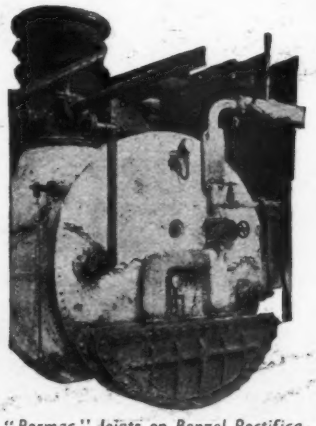


"Permac" Joints on a By-Product Plant.



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Capacity per Set, per 24 hours	2,394,000	cu.ft.
Calorific value of gas	462	B.Th.U.
Oil used per 1,000 cu.ft.	1·53	galls.
Dry coke charged into generator per 1,000 cu.ft.	30·05	lbs.
Carbon consumed in generator per 1,000 cu.ft.	26·19	lbs.

This 26·19 lbs. of carbon per 1,000 cu.ft. also produced automatically 65·0 lbs. of steam (from and at 212° F.) for use in the plant, and gasified 1·53 gallons of oil.

The above results, obtained when gasifying coke containing 84·5% fixed carbon, correspond to the following thermal yields* from the raw materials:—

1·32 therms as oil gas from each gallon oil gasified, in addition to residual oil-tar—about 15% of the oil used.

86·4 therms as blue-gas from each 1,000 lbs. dry coke, in addition to the production of the above waste-heat steam and the gasification of the oil.

**Computed by the method described in the Proceedings of The Institution of Gas Engineers, 1927-8, p. 526.*

Humglas House,
Carlisle Place, London, S.W. 1.

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Gas Journal

JUNE 24, 1936

Vol. 214 88th Year No. 3814

Editorial Notes

Gas and Chemical Engineering

Among the Papers presented at the Chemical Engineering Congress of the World Power Conference was a very appropriate one on "The Development of Chemical Engineering in the Gas Industry," by Mr. T. Campbell Finlayson—a contribution which shows the significance of chemical engineering to the progress of gas. At the outset the Author relates a highly interesting incident in the life of William Young, whose teaching, he suggests, may be regarded as the death knell of "rule of thumb" practice and the birth of the chemical engineering method of approach to the problems of gas manufacture. In general, since that time the milestones on the march of progress of the Gas Industry are associated with individuals whose success may be ascribed to their chemical engineering method of attack—"a close contact with industry and the problems to be faced, a depth of scientific knowledge to enable an analysis to be made of the fundamentals of the problems under examination, and an engineering knowledge upon which to build up the design of plant suitable for bringing into commercial use the fruits of their investigations."

Mr. Finlayson traces the development of the continuous vertical retort and points to the extent to which the chemical engineer has been helped in recent years by the work of the specialized research Associations such as the British Refractories Research Association and the British Cast-Iron Research Association. Concerning future development, he suggests that controlled cracking will be the central theme in carbonization technique for the next few years. Gas manufacture is basically the splitting-up of a hydrogen-carbon compound into lighter hydrocarbons; and the extent to which this treatment is carried is a matter for constant study according to the demands for the products. This we have emphasized frequently. For example, the demand for tar oils for hydrogenation may be such that the process of coal carbonization would be more profitable if retorts were designed to make the maximum yield of creosote fraction, the enrichers in the gas being mostly derived from uncondensable products such as methane. Or again, the demand for benzole and toluole may necessitate the operation of carbonizing plant to give the maximum opportunity for controlled cracking of the primary products. As the Author remarks, the investigator to-day in the field of controlled cracking has the advantage of bringing to bear upon his problems both the physico-chemical principles of pyrolysis and chemical engineering experience in the design of suitable apparatus.

The evolution of the water gas process to its present high level of mechanical and thermal efficiency is another application of chemical engineering principles in the design of plant. Again, the present high degree of efficiency of the various processes whereby crude gas is made fit for distribution may be largely attributed to chemical engineering developments. In this connection the Author has some interesting comments on removal of sulphuretted hydrogen. It is a striking fact that, in spite of many proposals, the old, comparatively crude system of hydrogen sulphide removal by means of oxide of iron still holds the field in Great Britain after many years' investigation work. Examination from a chemical engineering viewpoint, however, shows that oxide purification holds certain valuable advantages which are hard to replace; and it is the responsibility of a chemical engineer not only to advance, but also to assess the merits of existing processes and, where consideration shows it wise, to stand fast.

As indication of what chemical engineering means to the Gas Industry is the fact that the first President of the Institution of Chemical Engineers was Sir Arthur Duckham and one of the first two Vice-Presidents Dr. Charles Carpenter, and that at the present time about 20% of the members of the Institution of Chemical Engineers are engaged in the fuel industries. There is no question that in its search for improvement the Gas Industry will do well to make full use of that particular branch of engineering, Chemical Engineering.

The Small Undertaking

The attitude which finds expression in the Presidential Address of Mr. R. J. Gavin to the Waverley Association of Gas Managers is typical of that of many a manager of the small gas undertaking. It is an attitude of determination to give the best possible service based on a firm belief in the future prospects of gas. Mr. Gavin is Engineer and Manager to the Melrose Gas Company—an undertaking supplying a matter of some 15 million cu.ft. of gas annually. He explains that there has been no cheeseparing in regard to works renewals and repairs to ensure that they are fully adequate to meet the needs of the district, which include, of course, the maintenance of a satisfactory pressure, at all times, at consumers' burners. Mr. Gavin offers apology, quite unnecessarily, because his Address is largely devoted to discussion of how to meet competition. This aspect of the work of those in control of any gas undertaking, irrespective of size, must loom larger and larger if gas sales are to be

extended: and Mr. Gavin is glad that the days are gone when the staffs of gas undertakings were selling their product after the fashion of stamps over a post office counter. "There is so much satisfaction to be gained from a victory over a keen opponent," he remarks, "and so much to be learnt from a defeat, that clean competition adds a savour to our business which we should sadly miss were it suddenly withdrawn."

The sales staff at Melrose is limited. It consists of the Manager, a fitter, and an apprentice; but it makes up in energy and enthusiasm what it lacks in numerical strength. Realizing that the gaining of the lighting load is the thin end of the wedge of electrical competition, Mr. Gavin defends this load stoutly, and his efforts have met with a large measure of success. Switch controlled gas lighting installations are supplied on a deferred payment scheme, and hire-purchase arrangements are in force for the installation of modern enamelled cookers. The hire-purchase system for the less well-to-do classes of consumer is extended to a ten-year period—repayments being made by the pay-through-meter system. Nor is Melrose behind in its method of charging for gas. A block scale has been introduced with a substantial drop in price after the first 5,000 cu.ft. per quarter—a matter of 1s. 3d. per 1,000 cu.ft. in the case of prepayment consumers. Such a reduction does offer incentive to the consumer to increase his use of gas. The tariff has been in operation for only nine months, but already "it has proved of great assistance in selling additional loads such as water heating, and it certainly forms a bulwark to retain large lighting consumers." In connection with the lighting load in general, Mr. Gavin emphasizes the importance of retaining and extending the use of gas for lighting railway stations. This question demands a national effort, and it is satisfactory that the National Gas Council have the matter in hand.

Among other points touched on by Mr. Gavin in his Address are coke sales and propaganda. Regarding coke sales, the Melrose Undertaking enjoys a larger demand than it can supply, and these sales account for practically 40% of the coal bill. At the same time there remains the need for a district coke marketing scheme which would lead not only to the elimination of unnecessary competition and price cutting but would react to the benefit of the consumer in the supply of a product better able to satisfy his requirements. The time has come, too, for stronger co-operation between undertakings in a district to deal more effectively with many other problems. In regard to publicity the Melrose Company suggested to neighbouring undertakings that it would be good policy to have co-operative advertising in newspapers serving the districts supplied by the gas undertakings concerned. The suggestion was not, however, taken up. Not only do parochially minded undertakings suffer themselves, but their attitude reacts on the progress of gas generally. If gas undertakings will not of themselves come to some co-operative working arrangement in matters of this kind, who can blame a holding company for stepping in? Mr. Gavin has an interesting comment on postal publicity. Its pulling power, he says, is *nil*—unless followed up by a personal call. In this, the experience of Mr. Gavin is fully in accord with our insistence on the value of personal contact; and this personal contact is easier to obtain and maintain on the district of a small undertaking. Finally, Mr. Gavin remarks on the presence of sulphur compounds in gas as a drawback to the sale of flueless appliances. This, of course, is perfectly true. Elimination of sulphur compounds, or even their reduction to a comparatively small percentage, would greatly help gas sales; it is a question of the utmost importance calling for investigation and solution.

Comparisons

WHAT is the most promising method of approach in determining the relative costs of using different fuels for lighting, space heating, cooking, and hot water supply in working-class flats and houses? It is an extremely complicated problem, and we quite agree with Mr. S. C. Leslie, Publicity Manager to the Gas Light and Coke Company, that concerning it there is a great deal of loose thinking and loose figuring being done at present, some of which passes muster as research. Far too many statements are made and claims put forward in disregard of the factors governing the question. A given set of facts and figures may have no application to the circumstances to which it is sought to relate them. These views were expressed by Mr. Leslie in a Paper which he presented on behalf of the British Commercial Gas Association at a recent Conference of the Housing Centre—an organization under the patronage of the Minister of Health, Sir Kingsley Wood. Mr. Leslie did a useful service in stressing the complicated nature of the problem and pointing to the great variety of social, economic, and human circumstances which may affect figures in an unseen way. In arriving at estimates of cost, consideration must be given to regional peculiarities arising out of climatic differences, variations in industrial method, and local habit. In parts of the North, for instance, home baking is common—in the South, almost unknown. In the mill towns a higher proportion of women work away from home. Again, fuel costs for a block of flats in which there may happen to be a larger number of people than usual who take in washing will be distorted to such an extent as to offer a pretty riddle to anyone who does not know the explanation.

In regard to comparative costs of cooking by gas and electricity, Mr. Leslie summarized the outcome of 21 independent investigations carried out in America, Germany, Switzerland, France, and in this country. The results show very wide discrepancy and indicate the great need for careful examination in analyzing the position. The Author particularly emphasized that regard must be had to conditions of use. It is well known that the relative efficiency of gas compared with electricity for cooking is at its highest for the use of the burners on the hotplate, and it is a matter of experience that the use of the hotplate in working class households as compared with the use of the oven is much higher than it is in households with a larger income; in many working class households the oven is used little more than once a week. Factors such as this have their bearing on any estimate of relative costs. Mr. Leslie gave a table of figures showing the average consumption of gas and the bills for gas consumed in some 30 blocks of flats, including 1,659 individual flats, in London. There are wide differences between the figures for blocks of flats of similar type and with the same equipment—differences which point to the need for vigilance and caution in coming to general conclusions and in making general comparisons. Moreover, the average figure of cost per annum for those blocks of flats equipped with a gas cooker, gas wash-boiler or bath heater, and one fire is very little greater than the average cost for those flats equipped with a cooker alone. Is the explanation that the cookers are used for water heating as well as for cooking?

The Author asks for further impartial research into the economics of fuel consumption in working class dwellings, and research into the domestic habits, circumstances, and needs. He suggests that housing authorities in general should group themselves together to clear up the numerous points of national importance at present remaining uncertain. Certainly the Gas Industry would welcome an unbiased review of the whole subject.

Industrial Advertising

Amid the plethora of news, views, and ideas with which the Gas Industry is being favoured in connection with its domestic advertising campaigns, one hears and sees surprisingly little in regard to advertising the industrial load. This is all the more strange in view of the great amount of attention which has been devoted to this side of the Industry's activities during recent times. True, one occasionally comes across an industrial exhibition display or an advertisement for industrial gas in some newspaper's Trade Supplement; but compared with the amount of domestic propaganda, that devoted to industrial uses is very small. The point we would query is whether the industrial salesman has the backing of intensive propaganda that his domestic *confrère* enjoys and profits by; further, whether he needs it.

The foregoing thoughts were prompted by an article by the Chairman of the A.G.A. Publicity and Advertising Committee in a recent issue of the *Gas Age-Record*, in which Mr. Obermeyer discusses, primarily, methods of direct mail advertising. Before, however, going into some of the points he raises in this connection, it might be as well to refer to the prevalent idea that industrial advertising in the National Press does not reach the industrial administrator to whom it is directed. One cannot but feel that this theory is fallacious; for surely this class of potential consumer reads his daily newspaper with just the same avidity (albeit he may read a different part of it) as the person one is aiming to reach through the medium of the domestic appliance announcement. The National Press may not prove an economical or effective means of advertising particular industrial applications of gas—though there seems to us to be no reason why it should not do more in the direction of proclaiming the idea. But there are few, if any, trades nowadays which have not their own organ, wherein lies the opportunity for industrial gas propaganda by way of supplementing direct mail and displays.

In New York, Mr. Obermeyer points out, they started with a list of 30,000 consumers, covering every industry in their territory. This list was then divided into trade groups, certain of which were combined on the basis of their common interests in certain processes or types of equipment. Nearly one-third of the original list was eliminated entirely as it was judged not to be worth the mailing costs. Even a classification of a hundred or so, however, was treated with special attention. It was found that a four-page illustrated letter was the best means of approach. The first page contained a hand-signed communication referring directly to the business to which it was addressed, while the second and third pages, and sometimes the back cover as well, were useful in expounding the advantages of gas, in picturing typical installations and types of equipment, and, in general, covering the points of common interest. As the Author points out, not only are there ways and means of telling the industrial story in a manner that sells gas and gas installations; but there are existing facilities which gas undertakings are accustomed to using for domestic promotion only that are well adapted to the industrial problem. Among these are window displays. Industrial windows have a definite value from a promotional, as well as from an educational, point of view. They impress the passer-by as a demonstration of the variety and scope of gas applications. They help to " publicize " the industries which use gas—and they can be used to advertise gas to those industries. In short, it is evident that they believe in the States that industrial gas can be advertised successfully. It is, of course, ultimately a personal selling job for the expert industrial gas salesman; but he would benefit by the support of co-ordinated advertising. It is to be hoped that more consideration will be given to advertising in the proper quarters some of the thousands of ways in which gas can assist the industrialist.

Rising Prices

" The position of the Company is more promising than it has been for some years past, and given staple conditions at home and abroad, should improve during the course of the present year." This from the speech of Colonel H. W. Woodall, Chairman and Managing Director of Parkinson & Cowan, Ltd., at the general meeting last week, a report of the proceedings at which will be found on later pages. At the same time, Colonel Woodall emphasized that the price of practically every commodity the firm uses has advanced during the past three years. As an example, the price of the leather used for meter diaphragms has risen by more than 50% since 1933. Of more general seriousness and significance, however, is the advance in the price of what threatened to become " monopolistic coal." The situation was eased on Monday by the announcement made in the House of Commons by Captain Crookshank that in future the Chairman of each Committee of Investigation into the difficulties likely to arise through the Central Selling Schemes will be a member of the legal profession. This giving to the Committees a judicial character should, of course, go a long way to meet the legitimate demands of public utilities. However, dearer coal means more expensive gas making and using equipment—additional cost which ultimately, of course, falls as a burden on the consumer. Appropriately Colonel Woodall referred to this aspect. Whatever the difficulties, though, rising commodity prices, regarded as an index to prosperity, must not be allowed to interfere with the prosecution of research and investigation to improve the quality and performance of gas appliances to satisfy the requirements, ever more exacting, of the public. And in this connection it is gratifying from the Gas Industry's point of view that Parkinson & Cowan have no intention of modifying their policy of sustained research energetically pursued. Such research costs money, but it is money well spent. The firm knows it to be in its own interests, but equally obvious is the material assistance thereby provided to gas undertakings. Our Industry is indeed fortunate in the enlightened outlook of the manufacturers of plant and appliances.

Unfolding the Tale

It is not often that debates in the House of Lords provide matter for comment in the editorial columns of the " Journal," but there were references in the course of a discussion a few days ago which brought back to mind some of the ills which the technical reporter finds himself heir to. The occasion was a motion to the effect that, in the opinion of the House, the growing practice of reading speeches is to be deprecated. It is true that the reasons advanced for this opinion are peculiar to the House of Lords, which has its own reputation to live up to, and to this extent should be allowed freedom to conduct its business as may seem best to it. But the debate, in a way, flowed beyond the portals of the House, and it was this stage that caused our interest to be aroused.

What reporter is there who, recalling the many occasions upon which he has unavailingly strained his powers of hearing almost to breaking point, will not applaud the forceful declaration of Lord Snell that " audibility is not of necessity vulgarity," as well as the statement that " the worst service that any man can render to any audience is to be afraid of it?" It was, however, the

following speaker who really brought the reporter into the limelight. Lord Mottistone, in a speech strongly favouring the motion (which was agreed to without a division), said " it is much better that your Lordships' speeches should be adorned by the reporter of *The Times* than that they should smell of the lamp. . . . These expert gentlemen of the Press know what you mean to say, and they make the speech much better and clearer than you make it yourself."

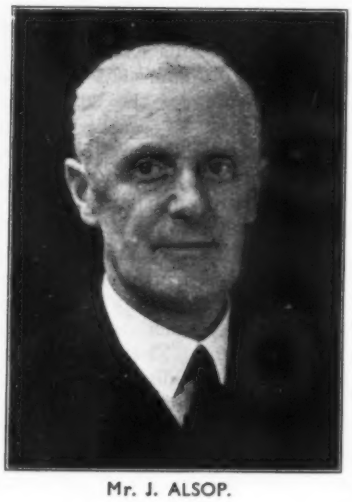
As readers of *The Times* parliamentary reports, we have not the slightest doubt that those responsible for them are eminently deserving of the bouquet handed to them by Lord Mottistone, but there are other reporters (ourselves among them) whose customary duties take them to less august assemblies, in which figures and arguments having a highly technical bearing are introduced in discussion, and so far as those other reporters (and we ourselves) are concerned there should be no necessity to assume what a speaker " means to say." Accurate technical reporting is a sufficiently difficult task without this further responsibility being superimposed upon it. A little polishing up here and there—that comes naturally as the result of experience—is, we feel, all that should be demanded of the technical reporter, beyond accurate reproduction of a speaker's remarks.

The speaker himself should, first of all, make sure that he has in the forefront of his mind precisely what he wishes to say, and then he should say it in a manner which is, beyond challenge, distinctly audible, both to his audience and to the reporters. When there is room even for a scintilla of doubt upon either of these points—then we plump for the written speech, which can afterwards be handed up to the Press table for purposes of checking. There would then be less likelihood of a subsequent paragraph being called for explaining that " owing to a slip on the part of the reporter," &c., &c.

PERSONAL

Mr. J. Alsop's Retirement.

Mr. J. Alsop, who retires under the superannuation scheme from the service of the Bolton Corporation Gas Department in November next, was made the recipient of a presentation by his fellow members of the Manchester and District Junior Gas Association on the occasion of their Ladies' Day, held at Southport on June 13.



Mr. J. ALSOP.

Mr. Alsop served for over seven years in an Architect and Surveyor's Office in Halifax. Leaving there, he spent four years with Drake's, Ltd., of Halifax, whence he entered the service of the Halifax Gas Department as Draughtsman. Two years later he was appointed Chief Draughtsman to Stockport Gas Department, where he served for 16 years. In 1918 he was appointed to a similar post with the Bolton Gas Department, which appointment he has held to the present day.

Mr. Alsop joined the Manchester and District Junior Gas Association in 1903 (five years after its formation). He became their Hon. Secretary in 1908 until 1913, when he retired. He was asked to return to the Association again as Hon. Secretary in 1919, which office he has held ever since, making a total of about 23 years' service as Secretary. In addition to this, he has served on the Council for some three years. He was for 17 years on the Council of British Junior Gas Associations; 9 years as Hon. Secretary of the Lancashire District Gas Education Committee, and Deputy Representative on the Gas Education Committee, while he has also rendered assistance with the Examinations of the British Commercial Gas Association's Education Scheme (" Domestic Gas Salesmanship Course ") since this scheme commenced. The Council (Juniors) have recently honoured Mr. Alsop by making him an Hon. Life Member of the Association.

* * *

Alderman R. D. and Mrs. BROMLEY, of Westville, Copthorne Road, Shrewsbury, on June 15 last celebrated their golden wedding and received many congratulations on the happy occasion. Alderman Bromley is the Chairman of Directors of the Shrewsbury Gas Light Company and has been a leading figure in the public life of the town for many years.

The Birthday Honours List.

Members of the Gas Industry will have been gratified to observe in H.M. the King's first Birthday Honours List a number of names well known in different phases of the Industry's activities. We would take this early opportunity of joining with their many friends in the Industry in congratulating them on the honour thus conferred upon them.

Baronet.—*Lieut.-Col. Henry Kenyon Stephenson, D.S.O., V.D., J.P., D.L., LL.D., for political and public services in Sheffield.*

Lieut.-Col. H. K. Stephenson is, of course, best known in the Industry as Chairman of the Sheffield Gas Company and a Past-President of the British Commercial Gas Association, having occupied the Presidential Chair in 1933. He was born in 1865 and on leaving Rugby entered the firm of Stephenson, Blake, and Co. (Sheffield), of which his father was the head, in 1883. Becoming a partner in 1888, he is now Chairman of the Company. In addition to this and his Chairmanship of the Sheffield Company, he is also Chairman of Thomas Turton & Sons, Ltd., a Director of the Sheepbridge Coal & Iron Co., Ltd., the Dinnington Main Coal Co., Ltd., and a member of Williams Deacons Bank.

Lieut.-Col. Stephenson's record of municipal service make remarkable reading. He has been a member of the Sheffield City Council since 1905, and had been on the Council only three years when he was chosen for the office of Lord Mayor. In 1910, when he had been out of office one year, he was elected Lord Mayor for a second time. During his first year of office he was elected an Alderman—a position he still holds. He took a prominent part in the work of establishing the University of which he is an Hon. LL.D., and was Treasurer and Chairman of the building fund. He was nominated by the King as first Treasurer of the University, and in 1910 succeeded the late Sir Frederick Thorpe Mappin as Pro-Chancellor. Since 1918 he has also been Chairman of the Council. He was also elected Master Cutler in 1919 and Coalition Liberal Member for the Park Division in 1918. In 1930 the Honorary Freedom of the City was conferred upon him. He has been a Magistrate for the City since 1905 and of the West Riding five years longer. Since 1922 he has been a Deputy-Lieutenant of Yorkshire.

Knight Bachelor.—*Frederick Joseph West, C.B.E., M.Inst.C.E., M.I.Mech.E., J.P., for public services in Manchester.*

Frederick J. West, Chairman and Managing Director of West's Gas Improvement Co., Ltd., is a figure well known in the Gas Industry. His untiring services for that Industry may, perhaps, best be epitomized in the following words, which formed the accompaniment of the Walton Clark Medal, with which he was presented in 1935:

" The Medal has been awarded to Mr. Frederick J. West in consideration of his outstanding service to the Gas Industry in the sphere of improved scientific development of gas-works practice and technique and

practical gas research as applied particularly to the carbonization of coal in vertical retorts, and for his work in the training and education of engineers and his success in promoting amicable relationships between employer and employed, all of which have been of substantial value to the Manufactured Gas Industry."

In 1924-25, Mr. West occupied the high position of Lord Mayor of Manchester and was for some time subsequently an Alderman of the City. He was elected a member of the Institution of Civil Engineers in 1925 and in the same year an Honorary Member of The Institution of Gas Engineers. His tour round the world in 1928, from which he brought back much useful experience and a number of fascinating accounts of his journeyings, will still be fresh in the memories of many of his friends.

Knight Bachelor.—*Gilbert Thomas Morgan, O.B.E., D.Sc., LL.D. F.I.C., F.R.S.*

Dr. G. T. Morgan is Director of Chemical Research at the Department of Scientific and Industrial Research in which capacity he has directed many lines of research whose results have had a far-reaching influence upon various phases of gas and by-product treatment.

Obituary

Bailie G. M. HENDERSON, a Bonnyrigg and Lasswade magistrate, died suddenly at his home in Bonnyrigg on June 13. Fifteen years ago he went from Burntisland to take up the position of Engineer and Manager of the Bonnyrigg and Lasswade Gas Light Company, which was latterly acquired by the Caledonian Gas Corporation. Deceased was elected to the Bonnyrigg and Lasswade Town Council three years ago, and last November was made a junior magistrate. He was forty-three years of age and leaves a widow and family.

* * *

The death took place on June 13 at his home, Grove House, Worcester, of Mr. EDWARD LAWRENCE ADLINGTON, for 41 years the General Manager and Secretary of the Worcester New Gas Light Company, and a Justice of the Peace for the City since 1915. He was 75 years of age. Mr. Adlington retired from active connection with the Worcester Gas Company in 1932 because of ill-health. He had then been in the service of the Company 56 years. Mr. Adlington leaves four sons and four daughters. The eldest son is Mr. L. S. Adlington, Assistant Manager of the Worcester New Gas Light Company.

Correspondence

Gas and the Science Museum

SIR,—Your statement in your issue of June 10 that the model of a modern gas-works is the only message from the Gas Industry to the Science Museum is not quite correct.

At the time that this model was presented to the Museum there was also erected in the Children's Gallery an excellent diorama of a modern all-gas kitchen. This is attracting considerable attention from the many visitors to the Museum.

I can confidently recommend the Children's Gallery to your readers of all ages. It is, I consider, one of the most fascinating sections of the Museum.

Yours, &c.,
R. N. LEFEVRE,
Officer I/C. Training.

Gas Light and Coke Company,
Watson House,
Nine Elms Lane, S.W. 8.
June 13, 1936.

Forthcoming Engagements

(There will be no meeting of the Central Executive Board of the National Gas Council during the month of June.)

June.

26.—ARTHUR DUCKHAM MEMORIAL FUND COMMITTEE.—Meeting at 28, Grosvenor Gardens, S.W. 1, 3 p.m.

30.—SOUTHERN ASSOCIATION.—Annual Summer Meeting.

July.

1.—FEDERATION OF GAS EMPLOYERS.—Meeting of Central Committee, 28, Grosvenor Gardens, S.W. 1, 11.30 a.m.

1.—NATIONAL JOINT INDUSTRIAL COUNCIL FOR THE GAS INDUSTRY.—Meeting at 28, Grosvenor Gardens, S.W. 1, 2.30 p.m.

2.—I.G.E.—Joint Research Committee at 2.30 p.m.

3.—MANCHESTER DISTRICT ASSOCIATION.—Manchester Meeting.

8-10.—CANADIAN GAS ASSOCIATION AND NORTH-WEST CONFERENCE PACIFIC COAST GAS ASSOCIATION.—29th Annual Convention, Vancouver.

15.—B.C.G.A.—Executive Committee Meeting at 11.30 a.m. General Committee at 2.30 p.m.

24.—SOUTHERN ASSOCIATION OF GAS ENGINEERS AND MANAGERS (EASTERN DISTRICT).—County Meeting at Swindon.

Sept.

10.—NORTH BRITISH ASSOCIATION.—Annual Meeting at Kirkintilloch.

Clockwork Gas Controllers by the Ton

Large Order for Singapore

One of the most recent export orders for gas controllers of the clockwork type called for the despatch of over four tons of these instruments. Supplied to the Gas Department of the Municipality of Singapore, they are to be used for street lighting, and are the third annual repeat order.

The controllers are of a special type, for the specification called for a type adaptable for use with both upright and suspension lamps. The controllers are in a weatherproof casing specially designed for their particular service. By reversing the by-pass and altering the regulation screws on the back of the case, the instruments can be fitted to either form of lamp as desired, the time controlling action of the clockwork requiring no adjustment. The clock mechanisms are also arranged for rapid removal and replacement in the event of a failure, and this can be done without interference with the other parts.

It is very satisfactory to find British gas apparatus being selected for this Far East service despite the keen foreign competition in the production of such instruments. The previous orders from the same source were for considerable numbers of controllers, but this is the first which can be measured in tons. The controllers were supplied by the Automatic Light Controlling Company, Ltd., of Bournemouth.

Purchase of Alva Gas Undertaking by Alloa

Reasons for the Low Purchase Price

With reference to the very low purchase price of £11,000 paid by Alloa Town Council for the 44 million cu.ft. per annum Works of Alva Town Council, the following explanation is of interest.

The explanation simply is that the Alva Town Council did not wish to make money out of the transaction, and offered the business to Alloa for the amount of outstanding loans—viz., £9,500, *plus* a satisfactory sum to meet parliamentary and other expenses, and the sum of £11,000 was finally agreed to.

In a sale by arbitration, for example, the price to be paid would probably have been from £25,000 to £30,000. Obviously, if this price had to be paid, the reaction would have been a higher price of gas to Alva consumers, representing capital charges on the increased sum. Instead, however, the Alva Council claimed, and it was granted, that they be placed on an equality with Alloa Burgh consumers as regards prices of gas and conditions of service.

The reason for the Alva Council wishing to sell their gas undertaking was simply that considerable immediate capital expenditure on manufacturing plant is necessary, and also that they felt as Alloa was about to extend their Works, there was no need to duplicate expenditure and, further, that the Alloa gas supply was only two miles distant, and Alloa could give lower gas rates.

This transfer is an interesting evidence of local authority gas supply being centralized in one gas-works. Alva Town Council may be congratulated on taking a wise view of the situation and of the future.

News in Brief

The Arthur Duckham Memorial Fund Committee will hold a meeting at 28, Grosvenor Gardens, S.W. 1, at 3 p.m. on Friday, June 26.

When the Electric Current Failed in Regent Road, Salford, on the morning of June 15, tramway traffic was completely disorganized and for some considerable time during the rush hour was brought to a standstill.

The Comprehensive Gas Exhibit which we described in our issue of June 10 and illustrated last week in connection with the Three Counties Show at Worcester was designed and erected by the British Commercial Gas Association in conjunction with the Worcester New Gas Light Company.

In Accordance with the Ruthin Gas Order, 1936, notice is hereby given that the calorific value of the gas to be supplied by the British Gas Light Company, Ltd., within the limits within which they are authorized to supply gas under the said Order as and from July 1, 1936, will be 500 B.Th.U. per cu.ft.

A Tully Complete Gasification Plant is now in course of construction at the Berwick and Tweedmouth Gaslight Company's Works at Spittal. All coal will be handled by machinery, instead of the present hand-shovelling, and the automatic feed will be into retorts vertically instead of being stoked horizontally.

By Order of the Directors of the Great Grimsby Gas Company, Messrs. A. & W. Richards are instructed to offer for sale by tender £40,000 4% redeemable debenture stock at a minimum price of issue of £102 per £100, yielding at that price £3 17s. 7d.%. The last day for receipt of tenders is Tuesday, July 7, at 11 a.m.

Prospectuses will be Forwarded, free of charge, upon application to the Registrar of the College, in connection with the degree courses in Technology and certificates in the Faculty of Technology arranged by the Manchester Municipal College of Technology. Further particulars will be found in our advertisement columns.

A Three-Years' Public Lighting Contract has been secured by the Lostwithiel Gas and Coke Company, Ltd., in direct competition with electricity. Various improvements are to be made to the street lighting, including the provision of larger lamps, additional lamps at several points, and all-night lighting at key points in the town.

The Woking District Gas Company, in pursuance of Section 7 of the Woking District Gas Charges Order, 1921, give notice that as from Oct. 1, 1936, they will supply gas of a calorific value of 500 B.Th.U. per cu.ft. in substitution for the present declared calorific values of 450 and 470 B.Th.U. to all consumers in the limits of supply as defined by the Woking District Gas Acts and Orders, 1912-1931.

The Wandsworth and District Gas Company, in pursuance of Section 25 of the Wandsworth, Wimbledon, and Epsom District Gas Act, 1929, give notice that as from Oct. 1, 1936, they will supply gas of a calorific value of 500 B.Th.U. per cu.ft. in substitution for the present declared calorific value of 470 B.Th.U. to all consumers in the Leatherhead limits of supply as defined by the Wandsworth District Gas Order, 1936.

The Question of Borrowing £1,000 for the equipment of a new showroom for the Clitheroe Gas Department provoked keen discussion at Clitheroe Town Council on June 17. Labour members argued that the site in Castle Street was unsuitable and Councillor Hallows thought it would be a good plan if the gas and electricity showrooms were combined. The proposal for new gas showrooms, however, was eventually approved.

During Gas Cookery Demonstrations at Wirksworth last week the electric lights suddenly failed, providing a useful opportunity which was seized at once by Mr. F. Hargreaves, the Engineer, Manager, and Secretary of the Wirksworth Gas Light and Coke Company. Although he had to bring gas from another room by means of flexible tubing, he had a satisfactory temporary gas lighting installation ready in five minutes' time, and saved the situation, in a double sense, brilliantly. The cookery and washing demonstrations were carried through to schedule, although the cinema in the same building was in darkness for the best part of an hour.

To Popularize Gas Refrigeration, the Dundee Corporation Gas Department are this week giving a series of demonstrations in their showrooms in Commercial Street. The demonstrations are being given by Miss M. Johnson, E.C.D.F., N.T.S.C.

The Manchester District Association are holding a meeting in Manchester on Friday, July 3, when visits will be paid in the morning to the Bradford Road Gas-Works and to the sales and service depôt at Gleden Street, where gas appliances are re-conditioned. Luncheon will be served in the Town Hall at the invitation of the Chairman and members of the Manchester Gas Committee, at which the Lord Mayor will be present. After luncheon, members will visit the Albion Ironworks of West's Gas Improvement Company, Ltd.

Sir Robert Mond, who was recently awarded the "Messel" Medal of the Society of Chemical Industry in Great Britain, has been elected President of the Société de Chimie Industrielle of France. Sir Robert has been, and still is, associated with a number of important firms in the chemical industry. A great deal of his original work has been in connection with electro-chemical processes and industrial chemistry and he was at one time associated in his work with Lord Kelvin. The "Messel" Medal of the Society of Chemical Industry is awarded every alternate year to a scientist who has attained eminence in applied chemistry.

A Most Successful Gas Exhibition and series of cookery demonstrations were held during the week June 8-12, in the Albion Hall, Earby, organized by the Earby and Thornton Gas and Lighting Company, Ltd. The Demonstrations were given twice daily using a Radiation "New World" gas cooker, and over 500 people attended. Miss M. Lee-Booker, the Radiation Demonstrator, carried out a varied syllabus, which was enthusiastically received by the audience at all sessions, and the week's Demonstrations were concluded by a happy little ceremony, when Miss Lee-Booker was presented with a cigarette case by the Gas Company.

Gas is to Play an Important Part in the Salford Housing Society's 313 flats at Strangeways, work on 71 of which has just begun. The living-rooms will be heated by a modern, colour finished cooking range burning coke and fitted with gas ignition, with a boiler attachment. There will also be gas cookers supplied by the Manchester Corporation and fixed in the kitchenettes. Each flat will have its own gas boiler for washing clothes, but a communal drying-room will be provided on the ground floor with either gas or coke heated cabinets which will dry clothes in as little time as half an hour. The scheme has been launched by the Society to provide homes for Salford families displaced by slum clearance schemes.

A Reduction in the Price of Gas of 2½d. per 1,000 cu.ft. was recommended by the Burgh Chamberlain of the Grangemouth Town Council when he submitted on June 16 his annual report on the gas undertaking. The convener of the Gas Committee explained that a considerable amount of the outlay in respect of pipes had been met out of the revenue, and this still left a credit balance of £857. Through this recommendation the price of gas would be for the ordinary meters 3s. 4d., and for slot meters 3s. 9d. for 1,000 cu.ft. It was agreed to approve of the recommendations and reduce the price of gas in the case of ordinary meters from May 15 last, and in the case of slot meters from the first survey after that date.

The Amount of Business Done during the year ended March 31 last by Messrs. James Keith & Blackman Company, Ltd., states their annual report, exceeded that of the previous year. After providing for payment of preference dividend, and making sufficient allowance for depreciation and reserves against doubtful debts, the audited accounts show an available balance standing at the credit of the profit and loss account of £39,035. The Directors recommend that this sum be appropriated as follows: In declaring a dividend on the Ordinary Shares at the rate of 15%, less income-tax, absorbing £22,875; in writing off freehold land and buildings, Arbroath, £3,000; and in transferring to reserve account the sum of £3,000; leaving to be carried forward to the current year a total of £10,160.

The Tenders for the Issue of Stock by the Directors of the Watford and St. Albans Gas Company, reference to which was made in a recent issue of the "JOURNAL," amounted to £164,018, of which £58,607 was allotted—this being sufficient to produce £92,247, the extent of the Company's present authorized capital. The highest tender was £160%, while the lowest tender accepted in full was at £156 2s.%. The average price of issue was £157 8s.

An Interesting Paper was read at a meeting at Gloucester organized by the Severn Valley Gas Corporation on June 9, to which the members of the Gloucester Master Bakers' Association were invited. The Lecturer, Mr. H. A. Cruxton (Secretary of Messrs. Cox Ovenbuilders, Ltd.), took as his subject "Clean Baking," tracing the development of oven building from the earliest days to the latest and most modern oven of all, the "Super Heat Trap Gas Fired Oven." A hearty vote of thanks was tendered to Mr. Cruxton and the hope was expressed that he would visit them again.

A New Scale of Charges has been adopted by the Oldham Gas Committee. These make concessions to the value of many thousands of pounds to all classes of consumers. It is proposed to introduce a two-part tariff not based on rateable value. Householders who undertake to pay 10s. per quarter can have gas at the rate of 1s. 9d. per 1,000 cu.ft. At present the charge varies from 3s. to 3s. 6d. per 1,000 cu.ft. Those who avail themselves of the two-part tariff and sign an undertaking to use only gas and coke for heating are to receive a reduction of 5% on the current price of coke. Others who do not take advantage of the new tariff can secure 5% reduction in the price of gas and coke by giving the undertaking referred to above.

Amalgamation and Grouping

Associated Gas and Water and Haywards Heath.

The Directors of Associated Gas and Water Undertakings, Ltd., announce that the Company has obtained the majority interest in the Haywards Heath District Gas Company.

British Gas Federation

Council Meeting

A meeting of the Council of the British Gas Federation was held at the Grosvenor Hotel, London, S.W. 1, on Tuesday, May 19, 1936—Sir DAVID MILNE-WATSON, LL.D., D.L., in the chair.

Public Lighting.—A discussion took place with regard to the question of the future development of public lighting by gas. It was decided that the Joint Lighting Committee of The Institution of Gas Engineers and the Lighting Section of the Society of British Gas Industries should be asked to prepare a Joint Report for submission to the Council on this matter.

Exhibitions.—A report from the Joint Gas Conference Committee was considered, and it was decided that a further Conference should be held at the British Industries Fair, Castle Bromwich, next year. The arrangements were left in the hands of the Committee.

Coal Mines Act 1930, Part I.—Consideration was given to the Draft Orders now lying on the tables of the Houses of Parliament, under which an unregulated monopoly in coal would be established in each district. After lengthy discussion, it was resolved that an emergency Special General Meeting of the Federation should be summoned for May 26, 1936, to consider what steps should be taken to remedy the position in the interests of Gas Undertakers and gas consumers.

Building By-Laws; Fixing and Ventilation of Gas-Burning Apparatus.—It was reported that a suggestion had been made that regulations should be drawn up with regard to the fixing of gas apparatus. A booklet entitled "Instructions for Fixing Geysers" had been compiled in 1930, and had been widely distributed and appreciated as representing sound practice. It had also been adopted in all its essential features by the Ministry of Health as the basis of their model by-laws.

It was now suggested that draft regulations should be prepared with regard to the fixing of gas fires and geysers. It was decided that a Committee should be set up to consider this question, and that the members should be nominated by each Constituent Body of the Federation, the Committee to have power to co-opt.

Propaganda Films.—It was decided that members of the Society of British Gas Industries and the British Commercial Gas Association should be asked to advise the Federation in future when they proposed to produce films, so as to obviate, so far as possible, duplication of film propaganda.

Women's Gas Council

National Council of Women's Conference at Southport.

Miss K. M. Halpin and Miss E. Willans have been appointed as the Women's Gas Council's delegates to the National Council of Women's Conference which is being held in Southport from June 29 to July 3.

Southampton Branch Inaugurated.

At the Coliseum, Southampton, on Tuesday, June 16, the Southampton Women's Gas Association, the first branch of the Women's Gas Council in Hampshire, was inaugurated.

Lady Bencraft, the President of the Association, was in the chair at the inaugural meeting, and among those supporting her were Lady Brickwood (Chairman of the Committee), Mrs. Whitehead (Hon. Secretary), and Mr. S. E. Whitehead, B.Sc., M.I.Mech.E. (Engineer and General Manager of the Southampton Gas Company).

Lady Bencraft said they could fairly claim that the women of Southampton and neighbourhood took a great deal of interest in all forms of public work and social service, as well as in any movement which tended to the increased comfort of themselves, their families, and their fellows. They were fortunate in having with them Miss K. M. Halpin, the Organizing Secretary of the Women's Gas Council, with which the Association was affiliated. "I do, however, trust," said Lady Bencraft, "that you will all become members of our Association, and that we shall be able to show you in the near future that we can provide something of interest and advantage in return for your support."

At this, their first meeting, they were to hear a lecture by Mr. Bowen Partington on "Good Health and How to Keep It," and, although they proposed to suspend activities during the summer months, they would draw up a programme for the autumn and winter. It would include lectures on health and cookery topics, a film display, and visits to local bakeries, kitchens, and other installations full of interest to women.

Miss Kathleen M. Halpin, Organizing Secretary of the Women's Gas Council, gave details of the organization of the Association. Seventy-five per cent. of the gas produced in this country, she said, was used in the home, so that housewives had a very real interest in the Industry.

Eighty-five members were enrolled at the close of the meeting.

Oil from Coal

New Distillation Plant Opened

On June 17, Sir Robert Horne, M.P., opened at Erith the new coal distillation plant of the National Coke and Oil Company, Ltd. The plant will use daily 150 tons of coal, which will be brought by sea and river from two Durham collieries. Under the process now in operation it is stated that each ton of coal will yield 12 to 15 gallons of petrol, 20 gallons of Diesel oil, and 15 cwt. of smokeless fuel. A similar plant under the same management has been in operation for some months at Tipton, near Birmingham, and it is proposed to start new plants later in Manchester, Cardiff, Glasgow, and Edinburgh. The process was described in the "JOURNAL" for Oct. 24, 1934.

Mr. W. B. Mitford, Chairman of the Directors, presided at the ceremony. He said that the Erith plant had cost over £80,000 to build and equip.

Damages for an Accident

Gas Company's Liability

Damages amounting to £200 and costs were awarded in a reserved judgment by Sir W. F. K. Taylor at Liverpool Court of Passage on June 16 to William Thomas Tipping, able seaman, of Rydal Street, Liverpool, against the Liverpool Gas Company.

It was stated at the hearing last month that plaintiff was walking along Dinorwic Road when his heel caught in a hole which turned out to be a gas valve box from which the cover was missing. He dislocated the cartilage of his knee.

Giving judgment, the judge held there was no negligence on the part of Tipping, as Dinorwic Road was not well-lighted. He was satisfied that at some date before September the lid had been raised by some unauthorized person and wrenched off, leaving the hole in which Tipping caught his heel.

His Lordship said that the servants of the Company, Corporation servants, and police officers all reported to the Gas Company instances of broken lids which they happened to observe. He held that the gas box was not in any way defective. He did not think it reasonable to hold that the

defendant Company should anticipate malicious damage and be on the alert to discover and remedy it.

"It seems to me to be reasonable to hold that this danger to the public using Dinorwic Road surface pavement should have been discovered within a more reasonable time by defendants, although I find that neither the Corporation servants nor the police were negligent. I think there is a duty on the Gas Company to discover such a danger within a reasonable time, and in my opinion more than reasonable time had elapsed before plaintiff met with the accident."

His Lordship granted a stay of execution.

"Gas and Coal"

Mr. L. F. Stemp Addresses Rotarians

"Gas and Coal" was the subject of an interesting Address by Mr. L. F. Stemp, of the National Gas Council, to the Beckenham Rotary Club recently.

Remarking that the magnitude of the Gas Industry was beyond the conception of the average man, he said the consumption of gas had doubled since the year 1901, and there were 130,000 men employed in the Industry—about 30% more than 15 years ago.

Most of these men were co-partners, for the Gas Industry was one of the pioneers of the co-partnership scheme by which men had an interest in the prosperity of the concern in which they were employed.

Commenting on the vital connection between the gas and coal industries, he said about 17 million tons of coal were purchased annually for the Gas Industry. Gas took about 10% of the total coal consumption of the country. The 17 million tons of coal purchased by gas undertakings was not all turned into gas. Many residuals were derived from coal in addition to gas, and there were 11½ million tons of coke and many tons of sulphate of ammonia and tar.

Mr. Stemp went on to deal with the Government's policy with regard to the coal industry, and in conclusion reminded his hearers that coal was of great importance to all national industries, and he hoped the people would realize that the claims of those engaged in the coal industry were reasonable and deserving of support.

A vote of thanks to the speaker was accorded on the proposition of Mr. P. Surman

At the Ormesby Iron Works

The above snapshot, which was, unfortunately, received too late for inclusion in last week's issue, shows the Rt. Hon. the Marquess of Londonderry, K.G., M.V.O. (right), and Mr. E. J. Fox (Managing Director) chatting with Nurse Williams, on the occasion of Lord Londonderry's visit to the Ormesby Iron Works of Messrs. Cochranes (Middlesbro') Foundry, Ltd., to inaugurate the new centrifugal pipe casting machines, a full description of which was published in last week's "JOURNAL."

Explosion at Dewsbury

Gasholder Demolished

A serious explosion occurred at the Gas-Works of the Dewsbury Corporation on Thursday last which caused the death of two employees and injury to two others. The holder concerned, stated to be of a capacity of 1,500,000 cu.ft., was demolished and the meter house and benzole plant were also wrecked. It is impossible to state yet how the explosion originated. This, of course, will be the subject of enquiry. Our photograph gives an idea of the

damage wrought. The accident occurred at noon, and gas supply was cut off from the town. During the Thursday night supplementary supplies of gas were obtained from the Batley Corporation, the Mirfield Gas Company, and the Ossett Gas-Works, but normal supply was restored early on the Friday morning.

New Season's List of General Gas Appliances, Ltd.

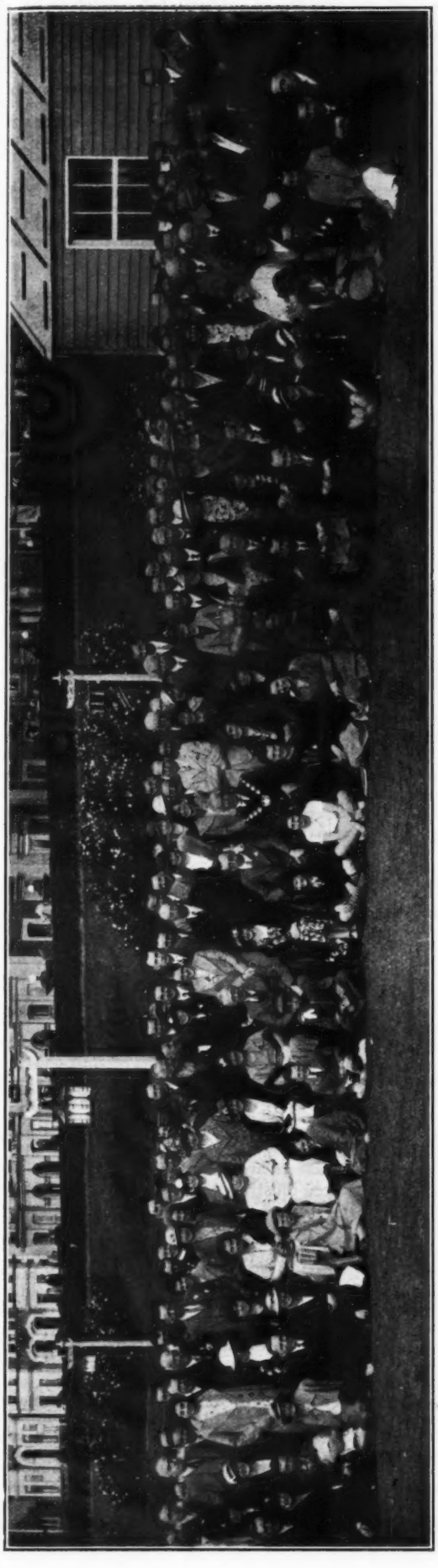
The "Louvre Plate"

Knowing that it is against the interests of economical production, runs the Foreword to the new season's list of General Gas Appliances, Ltd., Corporation Road, Audenshaw, Manchester, the Firm do not produce yearly models, but retain the successful features of a stabilized design, incorporating periodically that which advancement, experiment, and research have proved correct. General Gas Appliances believe that this policy protects both the gas undertaking and the consumer from excessive depreciation.

In the brochure are described gas cookers which, for beauty of finish, economy and efficiency in operation, and strength in construction, are claimed to represent the last word in gas cooker design. Certain exclusive features are detailed. Attention is drawn to the fact that the "Governor-General" cooker is fitted with a single burner which runs along the back of the oven. The patent bottom flue, by its ingenious design, compels the heat to circulate throughout the entire oven before leaving at the bottom of the cooker by means of the patent door flue. The heat passes upwards inside the door, along the passage inside the dome, and through the flue outlet at the top of the oven. Particular attention is drawn to the patented oven "Louvre Plate," which is specially designed to use when cooking plate pastries, pies, &c., with bottom crust. This oven accessory must not be used for any other class of cooking. The porcelain enamelled oven interior linings are designed so as to obviate the use of loose gates. The oven shelves, &c., are supplied in a new stoved aluminium finish and can be easily removed for cleaning purposes.

The "General" Auto-heat Regulator has been redesigned and is now presented with the "Visor" dial which tells at a glance the setting of the control. The chromium plated and bakelite finish makes its appearance all that could be desired.

The various models are illustrated in colour, and full details, together with a plan of the layout on the hotplate, are given in most cases. Specimens of the porcelain enamel finishes are portrayed in the publication. The brochure will be readily welcomed by gas undertakings as a handsome addition to their showroom literature.



Members and Guests of the Manchester and District Junior Gas Association Assembled for their Summer Visit and Ladies' Day at Southport.

Athletic and Social

Bishop's Stortford Co-Partnership Progress.

Continued success of the Co-Partnership Scheme, in connection with the Bishop's Stortford, Epping and District Gas Company, was reported at the Annual Meeting and Dinner held at Long's Restaurant, Bishop's Stortford, on June 9. About 90 attended.

Mr. W. J. Gee (Chairman of the Committee and a Director of the Company) presided, and with him were Mr. C. J. Spencer (Director), Mr. Evelyn Boys (Secretary of the Company), Mr. F. H. Robinson (Engineer and Manager), Mr. E. L. Burton (late Chairman of the Company), Mr. E. T. Brown (Distribution Superintendent), Mr. A. M. Law (Chief Clerk), and Mr. F. S. Downs (Assistant Manager).

At the commencement of the annual meeting the Chairman read a letter from Lord Ashfield (Chairman of the Company) expressing regret at his inability to attend, and tendering the warmest thanks of his colleagues and himself for the excellent work done by the co-partners.

The Chairman, reviewing the statement of accounts, said the Scheme had been in existence for 14 years, and to-day the investments stood at £6,965, the present market value being £20,285, and from that must be deducted a small loan (£3,482) generously advanced by the Directors of the Company to enable the Trustees to purchase £1,741 of stock under the terms of the new issue by the Northmet Company, which left a balance of £18,300. Each full-time co-partner, who was admitted to the Scheme at the commencement and who had not withdrawn his dividend interest, had to his credit 112·68 £1 Ordinary Stock, the value at the present market price being approximately £328. The allotment and interest was £15 10s. 5d. a year.

The present number of co-partners was 109. During the year one died, one had left the service of the Company, and eleven new members had been admitted. When the Scheme was started by Mr. Burton 14 years ago the sale of gas was 660,935 therms. To-day it was 996,515 therms, an increase of 50·07%. The increase in the number of consumers (from 4,695 to 8,895) was 89·4%, so that not only had the Scheme made good progress, but the Company had done so as well.

Proposing the adoption of the statement of accounts, Mr. W. A. Hollidge said their finances were in a very healthy state.

Mr. P. V. Clark seconded, and the resolution was carried.

The co-partnership meeting was followed by the annual dinner, at which Mr. E. L. Burton proposed the Toast of "The Company," which was responded to by Mr. C. J. Spencer and Mr. Evelyn Boys. Mr. F. H. Robinson proposed a hearty vote of thanks to the Directors, which was seconded by Mr. E. T. Brown and duly acknowledged by the Chairman. A toast to the Chairman was also drunk at the call of Mr. A. M. Law.

Swansea Superannuation and Co-partnership Schemes

The Annual General Meetings of the Superannuation Scheme and of the Co-Partnership Scheme of the Company were held on April 22 at the Y.M.C.A. (Minor Hall), St. Helen's Road, Swansea. Mr. Ernest H. Leeder (Chairman of the Company) presided, being supported by Messrs. J. F. Coonan and Hugh Bellingham (Directors), Mr. W. H. Johns (Engineer and Manager), Mr. Ernest Ablett (Secretary and Assistant Engineer), and by Members of the Committees of both Schemes.

Apologies for absence were submitted from Messrs. W. R. Lewis, W. H. Ashmole, and Ernest Davies (Directors).

Prior to moving the adoption of the Report and the Accounts for the year ended Dec. 31, 1935, the Chairman said: "We can all be thoroughly satisfied with the constitution and working of the Scheme which we inaugurated some years ago. This is our Twelfth Annual Meeting, and we have come through the test of twelve important years, indeed probably the most important years, remarkably well. For the last two years the Scheme has been operating strictly according to its constitution, that is to say it has been bearing its own responsibility for pensions, and employees have been retired at their 65th birthday. There were at the end of last year 40 members receiving superannuation allowances, and the amount paid out during the year as superannuation allowances was £1,884. A truly responsible amount you will agree, but nevertheless the Scheme has a Fund Account of the value of £31,953, and I am confident you will regard such a result as one on which we can congratulate ourselves."

The Chairman subsequently submitted the accounts of the Co-Partnership Scheme. He said: "As shareholders

of the Company and as Co-Partners you realize that the Directors were unable to make any allocation to the Co-Partnership Scheme out of the profits of the past year. At the outset I wish to say your Directors very much regret the fact that for the first time since the inauguration of the Scheme in 1913—war years excepted, of course—they have been unable to make an allocation to this deserving Scheme, inaugurated by Mr. Andrews. Circumstances, however, were such as made it quite impossible, and it must have been obvious to most of you, both from the remarks I have made at these Meetings of recent years and from the diminished amounts of recent allocations, that it was becoming more and more difficult for us to make even symbolic allocations.

"As to the Accounts themselves, you will have noticed that the Trustees of the Scheme hold £1,530 nominal of the Company's ordinary stock, and that there is a credit balance in the Fund Account of £58, and these amounts will serve to keep the Scheme alive until such time, which I, on behalf of my Board, hope will not be far distant, when we may be able to make once again a substantial allocation to the Fund."

Scottish Junior Gas Association (Eastern District)

Annual Outing to Edinburgh

The Annual Outing of the Scottish Junior Gas Association (Eastern District), marking the termination of the Presidentship of Mr. A. J. Doran, was held in Edinburgh on Saturday, June 6th, when a party of 60 spent an enjoyable day.

The Ladies paid a visit to the Edinburgh and Leith Flint Glass Works, where the famous Edinburgh Crystal is manufactured, seeing first the ingredients of which the crystal is made, then viewing the various processes through which it goes. Great interest was shown in the art of glass-cutting. Afterwards the Ladies visited the George Street Showrooms of the Edinburgh Corporation Gas Department and inspected the wide range of gas appliances there.

Meanwhile the members were renewing acquaintance with Granton Gas-Works, and, as usual, found new sources of interest, chiefly in the recently-installed benzole plant. The automatic control of the stripping plant was specially remarked upon. The electro-detarring plant and the site of the new purifiers were also inspected.

Members and Guests Assembled at Edinburgh.

The entire party was later entertained at lunch by the Gas Committee in the Albyn Rooms, Queen Street. Mr. Jamieson, who presided, introduced Councillor Gorman, who proposed the toast of the Association. Mr. Jamieson spoke of the facilities which the Association provided for the members to meet and interchange views with colleagues from other parts of the country. The Gas Industry had a wonderful asset in the work of these Technical Associations which helped to train and organize the young men to face the future with confidence.

Councillor Gorman spoke of the remarkable advance in the industrial applications of gas. He maintained that the Gas Industry was only in its infancy as far as commercial uses were concerned.

The President, Mr. Doran, replying, said that the Session now being brought to a close was one of the most outstanding they had had. He stressed the main object of the Association, which was the education of the members, and this they had fostered by their various visits during the year. In conclusion, he thanked Mr. Jamieson for his kindness and assistance, and also Mr. Melvin and Mr. Scott for what they had done to ensure the success of the visit.

Mr. Dow, of Kirkcaldy, thanked Mr. Jamieson for presiding and for his interest in the Association.

A Motor Coach Tour of Edinburgh's environs occupied the afternoon, and short visits were paid to Cramond on the shores of the River Forth, and to Swanston village, the boyhood home of Robert Louis Stevenson. The tour concluded by way of Craigmillar Castle. The day ended with tea at the Albyn Rooms.

Mr. Doran, presiding, spoke of the honour he had had in being President during the past year and wished Mr. J. M. Dow (Kirkcaldy), who would occupy the Presidential Chair next Session, a most happy and successful term of office.

Benzole Producers at Gleneagles

Our photograph, which was taken in connection with the recent International Conference of Benzole Producers at Gleneagles, shows Sir David Milne-Watson, LL.D., D.L. (Hon. President of the Conference), in the centre, with (from left to right) Mr. S. Henshaw (Chairman of the National Benzole Company, Ltd.), Lady Milne-Watson, Frau Hasslacher, and Herr Hasslacher (re-elected President of the Conference for the ensuing year).

Silver Jubilee of the Danish Gas Association

We extend our hearty congratulations to the Danish Gas Association which, this year, celebrates the twenty-fifth anniversary of its foundation after a period of most useful service to the Danish Gas Industry.

The event is marked by the appearance of a special silver jubilee issue of our esteemed contemporary *Gasteknikeren*, which was founded in the same year as the Association and is its official journal. The volume, dated June, 1936, is an elegant production and contains 110 pages of text.

The progress of the Association is traced in an article in which biographical notes and photographs of all the past and present officers are given.

Then follow a well-illustrated survey of the early history of the Gas Industry, a description of the modernized Fredericia Gas-Works, articles on gas-fired central heating boilers, the new coke screening plant at Aalborg, and street lighting with gas, and photographs of a new 2 million cu.ft. waterless holder—the highest in Denmark—during several stages in its erection at Aarhus, and of a special holder of 18,000 cu.ft. water capacity (90,000 cu.ft. storage capacity) under construction at Silkeborg.

Two further articles deal with the utility of gas output charts in connection with the rational operation of holders and with bottled gas.

The advertisement pages reveal the close connection which exists between this country and Denmark in so far as the Danish Gas Industry is concerned. English coals, plant, machinery, and appliances are extensively used in Denmark, and we naturally rejoice in the flourishing state of its Gas Industry, in which we take a paternal interest.

Stimulated by the successful achievements of the past twenty-five years, *Gasteknikeren* and the Danish Gas Association can look forward to the future with confidence.

Gas Central Heating and Hot Water Supply For 159 Flats

Part of the Ashley Gardens Estate, Westminster.

A five million B.Th.U. per hour gas central heating and hot water supply system is being installed by Thomas Potterton (Heating Engineers), Ltd., to serve eleven blocks of flats on the Ashley Gardens Estate, Westminster—believed to be the first installation of its kind to be undertaken on anything like so comprehensive a scale.

Many thousands of families, through the good offices (and excellent advertising) of our Building Societies and kindred institutions, are steadily moving away to the outer suburbs of our larger centres and founding vast new townships, which rejoice variously in such peculiar and often ill-applied titles as "garden cities" and "dormitory estates." But this "flight from the towns" would seem to be counter-balanced in some measure—whether or not it is a matter of cause and effect it is not for us to say—by a growing tendency on the part of others to move nearer in and occupy flats, with all their labour-saving amenities and ready access, in preference to the suburban or town house.

The result has been the springing up in our more populous districts during the last few years of prodigious buildings, consisting of blocks of flats which range from luxury apartments, with every service included in an annual rental that would purchase outright a couple of small freehold houses, down to dwellings designed to accommodate in comfort the artisan classes from the slum-clearance areas for but a few shillings a week.

The object of the proprietors of such blocks of flats has in more recent times been to make them of greater attraction to the potential tenant by the inclusion in the rental of all or as many as possible of the essential services. Thus have we been able to describe in these columns various interesting installations in which either gas or gas and coke have been the means of providing such services in the various classes of flats to which we have referred. In some instances large blocks for the artisan class have been equipped with individual gas or coke heating or water heating appliances in each apartment; multi-point gas water heating systems have also been applied to many of the "luxury" type of flat; while other methods we have described have included the provision of all the hot water and central heating requirements for a number of adjacent blocks from one or two conveniently situated boiler houses, in which a series of gravity-feed coke boilers satisfy all the needs of scores of flats both efficiently and economically.

Such installations as we have described, however, have been concerned with new buildings, where it has been possible to plan in advance the various heating systems and provide for the disposition of the necessary plant. But flat dwellings are no new institution; and the modernizing of older premises with a view to making them conform with the advantages offered by their younger competitors presents a very real problem to the owners and the heating engineer—and, as we shall endeavour to show, a great opportunity for gas.

Though the casual traveller through Westminster may not notice it, this district contains probably a greater number of flats than any other area of a similar size in the Metropolis. Just off Victoria Street, on the southern side, is situated the Ashley Gardens Estate, which consists of 159 flats, six or seven storeys high, divided up into eleven blocks, the majority of which are at least forty years old and planned on lines rather more lavish than labour-saving. Some are of a considerable size, containing palatial entrance halls, three or more reception rooms, four or five bedrooms, kitchen, scullery, butler's pantry, servant's bed-sitting room, and, in many cases, two bathrooms. And when we say that in at least one of the flats we visited there was still an ancient coal range, while much other apparatus of somewhat ancient "vintage" was just being removed in the course of modernization (including gas appliances of strange device, be it known), it will be appreciated that a general overhaul of all the blocks in a determined effort to bring them up-to-date was the only practicable way of getting the old stuff out and substituting decorations and equipment which would bring the premises into line with modern ideas.

In the course of modernizing these flats it was considered opportune to incorporate the latest ideas in the provision of hot water and central heating from a common source at a cost which would enable the new service to be included in existing rent contracts; but in reviewing the various alternative methods of providing this service, several peculiar features of the site had to be brought into consideration.

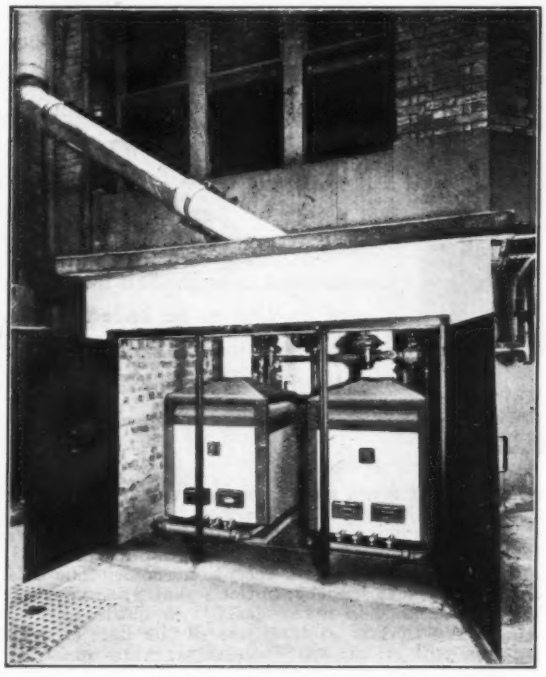
For instance, a solid-fuel installation would have necessitated a boiler house, with storage space, of such proportions that it would undoubtedly have fully occupied the whole of the one piece of gardens attaching to the Estate—a move which would have probably been extremely unpopular with the tenants—while such a plant, if it had not actually required a chimney as high as the tower of the adjacent Westminster Cathedral, would at any rate have entailed some sort of structure which would have brought it within the orbit of Local Authority sanction.

Apart from this one piece of open ground, the only other available space for the heating units, from a practical point of view, was in the areas, or wells, in the centre of each block, where the service lifts operate. Save in one block, where a small basement room was available, these wells constituted the only places for the heating units, and even here the floor space is limited to but a few square yards.

Three methods of heating were thus left for the consideration of the proprietors—namely, electricity, oil, or gas. The first method had to be ruled out on the score of cost. In the case of oil, not only was the necessary storage tank accommodation a serious impediment having regard to the small space available, but the noise of the blowers, which is inseparable from oil-fired boiler plant, would in all probability have proved extremely trying to the kitchen staffs whose quarters abut on the wells; the noise, moreover, would certainly have been magnified in the confined space. Furthermore, the question of adequate flueways to exhaust the products from oil furnaces would have been another stumbling-block.

After very careful consideration, therefore, and taking into account all the factors to which we have referred—as well as the essential point of disturbing existing tenants as little as possible in the changeover—the proprietors

wisely adopted gas, swayed in some measure, doubtless, by the attractive tariff which the Gas Light and Coke Company are able to offer in respect of such substantial loads. The contract for the whole installation, therefore, involving, as we have stated, an output of some five million B.Th.U. per hour, was placed with Messrs. Thomas Potterton (Heating Engineers), Ltd., of Balham, who commenced operations on the eleven blocks of flats last autumn, and



"Rex" gas-fired boilers in their brick and concrete housing.

are now well on the way to completing the installation. And it speaks volumes when we say that in putting in the new system the only disturbance to existing tenants was the cutting off of their hot water supply for four hours.

The units chosen were "Rex" boilers of approximately 288,000 B.Th.U. per hour capacity each; and in most instances two units were fitted per block, these being coupled up in series, though either boiler can be wholly shut down without interfering with the operation of the system.

Save in the case of the one block, where there was a small basement room available, and in another, where there was no basement at all and the plant had to be installed at ground level, the boilers have been placed in the wells at basement level. They have been housed in small brick and concrete chambers measuring some 8 ft. long by 5 ft. deep by 5 ft. 6 in. high. These housings are fitted with steel doors, the keys of which are in the charge of the attendant who is responsible for operating the boilers. In addition to air spaces under the doors, the boiler chambers have other air vents, both intake and outlet. The former are positioned low down in the walls to assist the combustion and ventilation of the boilers, while the latter are provided to assist air change and to prevent condensation within the boiler chamber. The main ventilating shaft consists of a 10-in. diameter asbestos flue-way which is carried up the well to the top of the building and terminated in a cowl.

An interesting feature of the flueway is that this is "broken" inside the boiler chamber. In other words, the outlet flues from the boilers stop off short so that the products exhaust direct into the boiler chamber and from here pass into the main ventilating shaft and are finally carried away. Perfect combustion and adequate air intake apertures render this method entirely satisfactory, with the added advantage of keeping the interior of the boiler chamber completely dry and free from any condensation. There is an excellent draught in the ventilating shaft, and apart from some natural feeling of warmth, it is quite safe to remain inside the chamber with the doors shut without any harmful effect or even discomfort.

Messrs. Potterton's water heating systems almost invariably work on the direct principle. But there is said to be an exception to every rule—and the installation at Ashley Gardens provides the exception here. Each flat—save where the presence of two bathrooms calls for additional capacity—is fitted with its own 50-gallon storage calorifier. Cold water from the flat's individual cistern passes into the calorifier and is heated by the coils fed from the boiler circuit. The 50-gallon calorifier has sufficient capacity to provide two or three baths in succession, and will completely heat up again after this in one-and-a-half hours—the whole storage being uniformly heated.

The external flow and return pipes are all well lagged with "Econite" moulded pipe covering, which is of vermin-proof composition and easy to fix by reason of its sectional construction. After application the outside surfaces are waterproofed with rubberoid, bound with wire mesh, and painted stone colour on aluminium undercoat. Separate circuits feed the central heating and the hot water supply, as the former, of course, is shut off during the summer. In some cases the pipes have been run up inside the service lift shafts, this being the only practicable approach to many of the flats. In addition to the usual hand control on each radiator, there are main control valves outside every flat, so that in the event of a tenant going away for a prolonged period the supplies can be turned off by the attendant—and there is thus no unnecessary wastage of heat travelling through an empty flat. It is interesting to note that all internal water piping work is being carried out with copper tubing, circulations being lagged and the cylinders fitted with cork jackets.

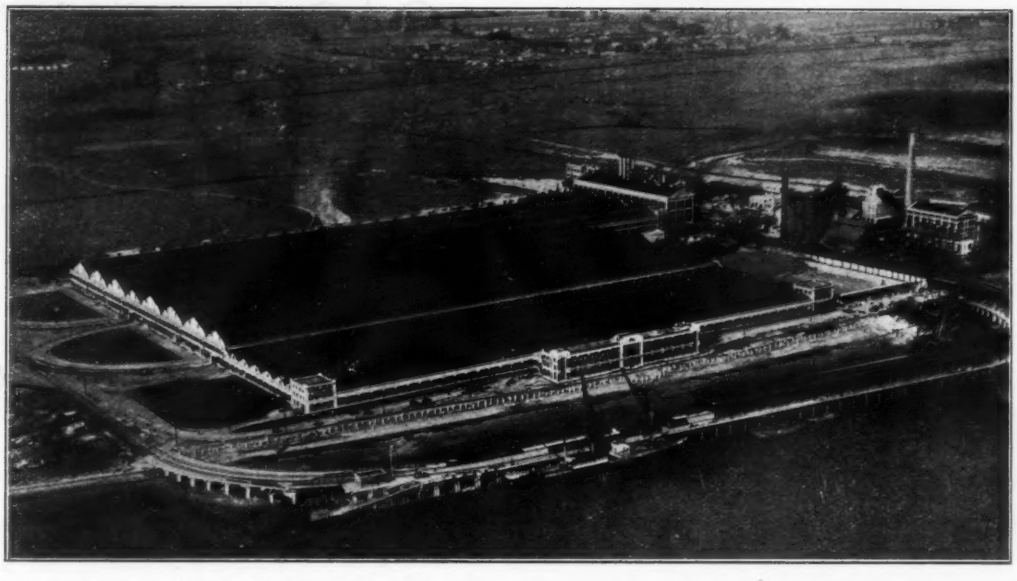
The distance the hot water has to travel in completing the circuit of an entire block must be several hundred feet, and it is all to the credit of the system that no auxiliary pumps are needed to assist the circulation even at times of peak demand. Moreover, the boilers require no attention other than the services of an attendant to shut them off at 11.30 p.m. each night and to light them up again at 5.30 a.m. each morning. Thus it will be seen that the plant is not in operation during the night, though it should be added that, unless two full baths are drawn off after 11.30 p.m., the water remains hot in the calorifier throughout the night; and, in any case, it has been brought up to full temperature again in plenty of time for the early morning demand. A thermostat working on the main circuit prevents overheating and maintains proper temperature conditions throughout the whole system. Maintenance costs are extremely low, as in normal circumstances the boilers will only require attention for cleaning once per annum.

View looking up the "well." Note ventilating shaft.

It should, perhaps, be mentioned that in the block where the boilers had to be placed at ground level it was necessary to run a special circuit to serve the two ground-floor flats. Apart from this, the systems for all the blocks are mainly designed on similar lines.

This installation at Westminster is believed to be the first of its kind yet undertaken on so large a scale; as we have said, the work started last November, and one complete block has been dealt with each month since then. It is, moreover, very gratifying to know that so far the system has been operating extremely well, and both management and tenants have expressed complete satisfaction with the results.

Coke Salesmen's Circle



An Aerial View of the Dagenham Works. Since this photograph was taken the new power house has been completed on the extreme right of the picture.

Visit Ford Works

On Tuesday, June 9, a large party of members of the London and Counties Coke Salesmen's Circle paid a visit to the Works of the Ford Motor Company at Dagenham, where they inspected the blast furnaces and coke ovens as well as the whole process of motor-car manufacture from start to finish.

Added interest was given to the visit by reason of the enjoyable trip down to Dagenham and back by water in the M.S. " New Dagenham," on which lunch and tea were served on the respective journeys.

The Dagenham Works of the Ford Motor Company may truly be described as one of the marvels of modern engineering and industrial development. Six hundred acres of barren marshland—a few years ago one of the loneliest spots to be found anywhere near London—were reclaimed by one of the greatest piling feats ever undertaken, and on this site to-day is the largest motor factory in Europe, employing not far short of 10,000 hands.

The huge building fronts the river, and its size, even when expressed in bald figures, is astonishing. The main shop, for instance, is 28 acres in extent, and it required 100,000 tons of concrete to provide the one unbroken slab of reinforced concrete flooring, into which 2,500 miles of steel were built for added strength. The roof of this 28-acre shop is constructed of one million square feet of metal and six hundred thousand square feet of glass. On the north side, farthest from the water, is the foundry and hot metal building where the rough castings are made; this shop measures 1,300 ft. by 300 ft., and is equipped with the most up-to-date plant for handling hot metal at high speed. Next to the foundry is the manufacturing shop, 1,000 ft. by 300 ft. Here the rough castings are turned into components, which, despite the speed of production and the huge quantities handled, are each beautiful examples of precision work, accurate to within a few ten-thousandths of an inch.

At the southernmost end of the building is the assembly shop, with its steadily moving conveyor on which complete vehicles take shape as the onlooker watches, and are finally run off ready to be driven away. This assembly line is the most " magnetic " feature of the works to the visitor, and is one of the many Ford ideas for saving waste of time and effort in production. In short, these works are an epitome of the marvels of modern car building, for at one end one may see the molten metal entering the foundry, while at the other end the new cars are driven off the assembly line and away to their waiting buyers. A more self-contained unit is hard to imagine.

The works are complete with their own hospital and school for the training of a hundred boys at a time in every phase of manufacturing production. At the jetty raw materials can be unloaded at the rate of 600 tons every hour, and from here also new cars and tractors are shipped for export. Since the accompanying photograph was taken the new power house on the extreme right has been completed, and here it is ultimately expected to burn under the boilers a considerable amount of London's rubbish. The present capacity of this power house is equivalent to the requirements of a town of 180,000 inhabitants.

The Coke Oven Plant.

It will, perhaps, be the coke ovens and ancillary plant which will be of more particular interest to the Gas Industry. These consist of 45 Wilputte-Coppée regenerative ovens of a capacity of 358,500 tons of coal per annum. Each oven takes a charge of 13 tons, the carbonizing period being from 15 hours. There is a complete by-product recovery plant, tar, sulphate, rectified benzole, and gas being recovered. A large proportion of the gas is utilized for heating the ovens, though a certain amount is used for other purposes throughout the works.

The installation is equipped with the bunker type of dry cooling plant, which consists of a brick-lined and well-insulated chamber into which the incandescent coke is periodically charged by means of a skip hoist. This type of cooling plant is used mainly for large capacities and particularly where ground space is limited, as it lends itself to being placed astride railway tracks. From the installation at Dagenham steam is raised at 200 lb. per sq.in. superheated to 600° F., the average steam production per ton of coke cooled being 1,100 lb. Power consumption is around 3 kWh per ton of coke cooled. This plant has been in operation since the end of March, 1934, and the principal data are as follows:

Coke to be cooled in 24 hours	700 tons
Number of charges in 24 hours	75½
Weight of each charge	9·27 tons
Interval between two charges	about 19 minutes
Normal quantity of steam raised in full service	about 11⅓ tons per hour
Steam pressure	200 lb.
Superheat	600° F.
Number of cooling units	2

The coke is cooled from 1,800° to about 570° F. (980° to 300° C.) in normal service, both cooling units working in parallel, with one common fan for circulating the inert gases, the second fan being a standby unit. It is exceptional to use only one cooling unit, but in such cases the coke is cooled from 1,800° to 790° F. (980° to 420° C.) when two circulating fans are used working in series.

The visitors also inspected the blast furnaces and saw the molten metal pouring into vast cauldrons, which are subsequently tipped on to a moving belt which in itself forms the pig moulds, the pigs being water cooled as they travel up the belt. Another interesting plant was that which mixes up various breeze and metal filings and fuzes them together into a clinker which is utilized in the furnaces.

LONG SERVICE TO THE GAS INDUSTRY

A number of firms of long standing on the contracting and manufacturing side of the Industry have collaborated with the "JOURNAL" in the production of a series of articles, under the above title.

Thomas Glover & Co., Ltd.

The beginning of the firm of Thomas Glover is so closely bound up with the invention and development of the dry gas meter that it may be as well first of all to consider the relations obtaining between the supplier and consumer of gas in the days when the Industry was in its infancy. The original haphazard method of charging so much for each burner could hardly be called satisfactory to the supplier or the user, but in 1815 the invention by Samuel Clegg of the wet meter put both parties on a more business-like footing. However, the wet meter, although it accurately measured the gas which passed through it, had its disadvantages, the principal of which was its liability to freeze, and a number of engineers were endeavouring to produce a device whereby this difficulty could be overcome.

In the early forties of last century a Mr. William Richards was experimenting with a view to constructing a reliable dry meter, and in the course of his endeavours he became associated with Mr. Angus Croll, who rendered him such practical assistance that a patent was taken out in the name of Croll and Richards, and the manufacture of dry meters was commenced. But these were not a practical proposition until 1844 when Mr. Thomas Glover, the founder of the present firm, joined the partners. Mr. Glover had previously been in business in Leith as an engineer and brassfounder, and records left by him show that he had for some 20 years been doing a good deal in the way of repairing wet meters and other kinds of gas apparatus.

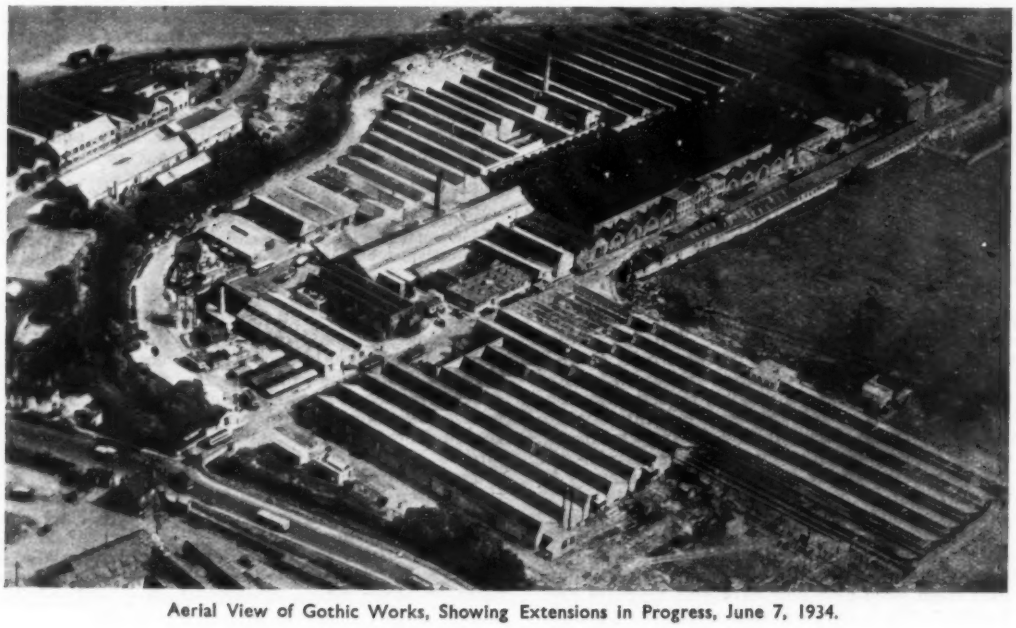
To his new associates Thomas Glover introduced his slide valve, and by the adoption of this the first really dependable dry meter was put on the market. This type of valve, increased in size to deal with modern loads, is the standard for most of the dry meters of to-day, and it may be interesting to note that in the United States of America they are still described as "Glover Valves."

Shortly afterwards Mr. Glover assumed full control of the business and opened premises in Suffolk Street, Clerkenwell, in his own name. The popularity of the dry meter and the consequent increasing volume of business soon made additional accommodation necessary, and further premises were secured in St. John Street, Clerkenwell, from which many thousands of meters were turned out annually.

The earliest dry meters were mostly of the "Fiddle pattern" shape as shown in the illustration of No. 1 (now in honourable retirement at the firm's Edmonton Works after 52 years' service at Coventry). It seems likely that adherence to this design for some time was due to copying more or less the outlines of the wet meter, but it had the undoubted effect of leaving little room for the valves and top-work generally. To avoid any cramping of working parts, Mr. Glover introduced the square case in 1847, the first of this type being sent to Ironbridge.

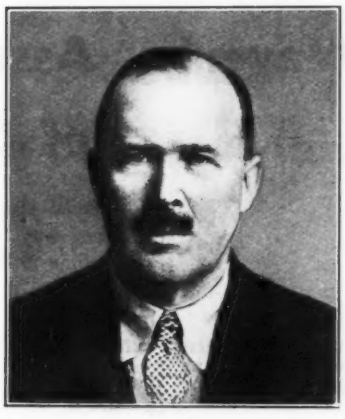
At the Exhibition of 1851 held in Hyde Park, a 3,000-light meter made by the firm was installed, this being the largest dry meter constructed up to that time. The firm also had various meters on exhibition, and the premier award was granted them on that occasion.

In the early months of 1855 a frost of more than usual



Aerial View of Gothic Works, Showing Extensions in Progress, June 7, 1934.

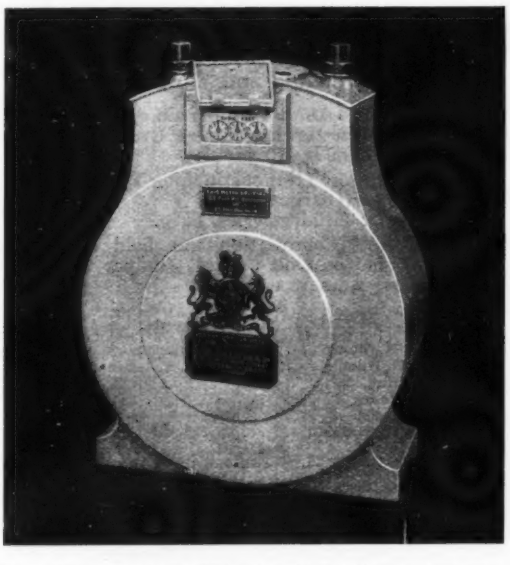
Mr. Thomas Glover,
the Founder of the Firm.



The Present Managing Director,
Col. W. R. Glover, C.M.G., D.S.O., T.D.

severity occurred, and it is recorded that " three parts of the Thames are now frozen over and neither steamers nor small craft can be navigated up or down the river." Use was made of this occurrence for an advertisement in favour of the dry meter appearing in *The Examiner* of Feb. 24, 1855, when we find Thomas Glover announcing that " the present very severe frost suggests to him the propriety of reminding gas companies and gas consumers of the advantages of his patent dry gas meter and the disadvantages of wet gas meters as stated below." (Here followed a list of the merits of the one type and the failings of the other.)

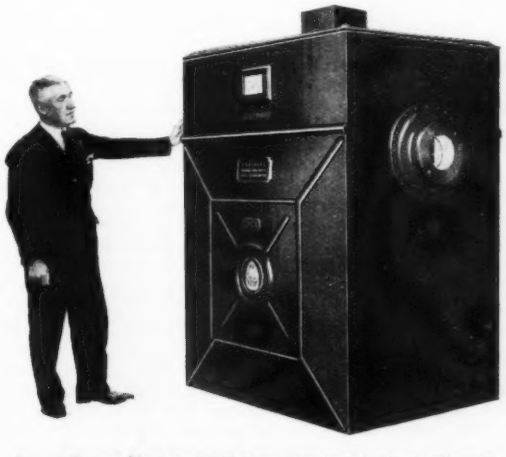
The Founder of the firm died in 1868, and the direction of the ever-expanding business devolved upon his brother, John Glover, who in turn was succeeded by the sons of the Founder—Richard Thomas and John George. These gentlemen were afterwards joined by the Rt. Hon. Thomas McKinnon Wood who, after the firm had been made a Limited Liability Company, became Chairman in 1918—a position which he filled until his death in 1927. He was succeeded by the present Chairman, Mr. Kenneth Aird, who had joined the Board in 1897, while the grandson of the Founder, Colonel William Reid Glover, C.M.G., D.S.O., T.D., acts as Managing Director.



No. 1 Meter—made in 1844 and still in working order; now in retirement at Gothic Works.

The advent of the prepayment meter resulted in an enormous increase in the consumption of gas, and, of course, in the output of meters. A patent for a price-changing device *in situ* was taken out by Messrs. Richard and John Glover in 1894, and this " price-changer plate " has now been universally adopted.

The year 1897 saw an amalgamation with the well-known firm of cooking and heating appliance manufacturers—R. & A. Main, of Glasgow. At the time of the amalgamation it was found that further extensions had become a matter of urgency, and the associated Directors decided to build an entirely new factory for each firm. Nineteen acres of ground were purchased at Edmonton, and when Gothic Works was completed in 1899 it was thought that the 19-acre site would be sufficient for all future requirements. However, in spite of extensions here and there during the years that followed, it was found necessary to acquire more ground, and the meter making side of the business is now housed in a brand new factory fitted with the most efficient modern plant that can be secured.



Latest Type of Industrial Meter, fitted with " Tottenham " Maximum Load Recorder.

The parent Works at Edmonton is assisted by eight thoroughly up-to-date branches in various parts of the country, and in addition to producing dry meters, they carry on the manufacture of complete sets of testing apparatus, gauges, street lamps, and many other accessories. In the well-equipped laboratories at Gothic Works a trained staff is not only constantly employed in testing everything that goes into the making of a meter, and in experimenting for the future, but their services are at the disposal of any gas undertaking which should require them.

In the various processes of making meters, Thomas Glover & Co. during 1935 used over 35 million cu.ft. of gas, and as their associated firm accounted for another 113 million, making a total of 148 million cu.ft., they feel that in more senses than one they are endeavouring to give service to the Industry.

While appreciating the great strides that gas has made in its application to Industry during the last few years, the firm are optimistic enough to foresee even greater developments in the near future.

Waverley Association of Gas Managers

Annual Meeting in Edinburgh

The Annual Meeting of the Waverley Association of Gas Managers was held in the Goold Hall, Edinburgh, on Friday, June 19—the President (Mr. R. J. Gavin, of Melrose) in the Chair.

The PRESIDENT, at the outset, extended a warm welcome to the members and said he was very gratified to find such a large attendance.

The SECRETARY and TREASURER (Mr. R. J. Philp, North Berwick) having announced the apologies for absence, the PRESIDENT referred with regret to the loss sustained by the Association through the deaths of a number of members, and a silent tribute was paid to these members by the meeting.

The SECRETARY read the minutes of the last meeting and these were adopted.

When the Statement of Accounts was presented to the meeting it was proposed by Mr. R. W. COWIE (Hawick) that the honorarium to the Secretary should be increased to £15. Mr. Cowie said that although this honorarium did not adequately repay Mr. Philp for the vast amount of work he did for the Association, it would show their appreciation of those services so freely given. The proposal was carried unanimously.

The following new members were then admitted to the Association:

Ordinary Members.

J. G. Cuthbert, Engineer and Manager, Kelso.
J. S. McLaren, Engineer and Manager, Langholm.
A. C. Finnie, Engineer and Manager, Duns.
R. Stevenson, Engineer and Manager, Moffat.
T. A. Rowan, Engineer and Manager, Grangemouth.

Extraordinary Members.

James R. Thomson, Messrs. James R. Thomson & Co., 146, Clyde Street, Glasgow, C. 1.
Alastair M. Grant, Alder & Mackay, Ltd., Newgrange Meter Works, Edinburgh.
J. E. Vickerstaff, Stanton Ironworks Company, Ltd., 200, St. Vincent Street, Glasgow.
George Williamson, Walker, Parker & Co., Ltd., Newcastle-upon-Tyne.

New Officers.

The election of the office bearers for the next year was then proceeded with.

The PRESIDENT, in proposing Mr. W. B. McLusky (Halifax) as his successor, said that Mr. McLusky was a pioneer and original thinker and he had had a long and honourable career in the Gas Industry. He wished him a very successful and happy year as President of the Association.

Mr. D. VASS (Perth), in seconding, reminded the members that Mr. McLusky would be renewing his official connection with the Association since, while at Kelso, he had been their Secretary.

Mr. McLusky, in acknowledging the honour which had been bestowed on him, said he was sorry that he was interrupting the line of young Presidents, but he hoped he would be able to do something specially for the older Associations.

Mr. R. J. PHILP, the Secretary and Treasurer, and Mr. J. O'HALLORAN, the Auditor, were re-elected for the coming year, while Messrs. R. A. Harvey (Lockerbie), R. W. Cowie (Hawick), and J. F. Skea (Jedburgh) were elected to the Committee for two years.

Mr. GAVIN then delivered his Presidential Address.

Presentation of Medal to President.

Mr. E. SHIELL (Thurso) said that as immediate Past-President it was his happy duty to present Mr. Gavin with the medal which he hoped would serve to keep the honour fresh in his memory. He had been a most capable President, and he trusted that he would have many happy memories of his year of office.

Mr. Gavin replying, expressed his thanks to Mr. Shiell and to the members for their kind appreciation. He had found his duties very happy.

Mr. D. VASS (Perth) proposed a vote of thanks to the President and to the members of the Committee for the efficient way in which they had performed their duties during the past year.

Luncheon.

At the conclusion of the meeting the members adjourned to the North British Station Hotel, where they lunched together.

After the Loyal Toast had been observed, Mr. W. B. MCLUSKY proposed the toast of "Kindred Associations." He said that it gave him great pleasure to propose this toast to the other Associations which were offsprings of the parent Waverley Association.

Mr. JAMES DICKSON (Kirkintilloch), President of the North British Association of Gas Managers, said, in reply, that it was this friendly kindredship which existed between the Gas Associations which made them outstanding. The meetings of the Waverley Association were to be commended because they gave opportunities to the young men to put their views forward. He conveyed the good wishes of the Kindred Associations for the future welfare of the Waverley Association.

The toast of "The Chairman" was proposed by Mr. ALEX. DOW (Galashiels). He said that this duty had probably fallen on him because the President had at one time been his assistant. They would all agree about the excellence of the President's Address. His spirit of enthusiasm for the Gas Industry was still as great as that shown by him as a young lad. He rejoiced in victory over a competitor and learned from defeat. There was no fear for the welfare of their great Industry when there were such able and enthusiastic young men as Mr. Gavin.

Mr. GAVIN expressed his appreciation of the spirit in which Mr. Dow had proposed his health and for the kind way in which the members had responded.

After the lunch the company were entertained by songs from Mr. John McLeod and humorous recitations by Mr. R. D. Anderson, of East Linton.

Bowling and Golf.

On Thursday, June 18, a Bowling Competition was held on the Juniper Green Bowling Club's Green and was won by the following team by 10 shots:

G. Williamson (Newcastle-upon-Tyne),
T. Shearer (Glasgow),
A. Stewart (Blairgowrie), Skip.

The Annual Golf Competition was held on the same day over the Baberton Golf Course, Juniper Green, Edinburgh. The prize winners were:

SECTION I. (HANDICAP 1–10).

1.	D. H. Munro		Glasgow
2.	J. R. Hunter		,,
3.	S. Hall		Edinburgh
4.	A. Young		,,
Tie 5.	H. Rule		,,
	M. A. Waddell		South Queensferry

SECTION II. (HANDICAP OVER 10).

Tie 1.	J. K. Harrison		Armagh
	J. D. Couper		Glasgow
3.	J. Galloway		Edinburgh
4.	C. Hamilton		Loanhead
Tie 5.	W. McRobbie		Edinburgh
	L. Gardner		Lenzie

At the conclusion of these Competitions the members had tea in Baberton Golf Club House. After presenting the prizes to the successful competitors, Mr. Gavin expressed the thanks of the members to Mr. Logan, of Juniper Green, and to Mr. Lorimer, Captain of Baberton Golf Club, for the courtesy extended to them. The weather had been delightful and they had all spent a most enjoyable day.

Mr. R. J. GAVIN.

The Waverley Association of Gas Managers

Presidential Address

OF

Mr. R. J. GAVIN,

Engineer and Manager of the Melrose Gas Company

In the first place let me express my thanks for the honour you have done me in electing me your President for this session. As a native of the district which gave birth to this, the oldest, Gas Managers' Association, it gives me particular pride to have my name recorded among those distinguished men who have preceded me, and I can only hope that I shall be able to discharge my duties in a way not unworthy of our great traditions.

The Gas Industry, like the majority of the industries of this country, is emerging from the depression period, and the brightening of trade prospects, welcome though it is, brings with it new problems to be solved. A national coal strike was recently averted through the self-sacrifice of the public utility services in voluntarily conceding an increase in contract prices to the coal industry, but unhappily the situation seems to be none the better, and one is forced to question the wisdom of making the concessions.

We are now faced with further advances in the price of coal, and, what is more serious, there seems to be a tendency on the part of the Government to force coal masters in each district to group together, forming a virtual monopoly with powers to force the Gas Industry to accept unsuitable and inferior coals through the quota system.

The burden of these higher prices and the loss occasioned through the enforced use of unsuitable raw material by our Industry must of necessity be passed on to the general public, who use our product; and there is a clamant necessity for the Government to amend the coal selling scheme so that the Gas Industry may be represented on the board in order that the public may be protected from exploitation.

The man-in-the-street seems to imagine that gas undertakings are so substantial that they can easily stand an increase in price, but the days of monopoly are past, and faced as we are with competition from oil, electricity, and even coal itself, increases in the price of gas are, to say the least, distasteful to every Gas Manager who is trying to maintain that upward curve in his sales chart.

Competition, as I have said, is increasing, but speaking as a Manager of a small undertaking, I do not regret that the days are gone when the staff of gas undertakings were selling their product after the fashion of stamps over a post office counter and no one needed to feel the urge to go out and battle for a new consumer. There is so much satisfaction to be gained from a victory over a keen opponent and so much to be learnt from a defeat that clean competition adds a savour to our business that we would sadly miss were it suddenly withdrawn.

In meeting competition it is essential that the manufacturing plant should be as efficiently run as is possible within the resources of the undertaking, be it large or small, and the type of plant to yield the greatest economies must be carefully chosen to suit the particular needs of the district that it serves.

Though it has no original or novel features, the works plant at Melrose has been carefully planned with a view to the needs of the district and reflects credit on the management in the past. Nor has anything been neglected through cheeseparing in having necessary renewals and repairs carried out. The carbonizing plant consists of fifteen 9 ft. 6 in. by 22 in. by 15 in. D shaped horizontal retorts in three benches of six, five, and four retorts respectively in regenerative setting, and it has not been thought advisable to supplement these with water gas plant for reasons which I will go into later. Atmospheric condensers, Livesey washer, rotary scrubbers and purifiers, station meter, and four holders with 8 in. connections summarize the plant.

Storage Capacity.

In view of the coming of the Highland Show to Melrose this year and the very heavy demand for gas thereby entailed, my Directors decided to increase the storage capacity at the works.

The larger holder had a capacity of 40,000 cu.ft. and provision had originally been made for telescoping. This telescoping has been carried out and the capacity doubled. To have this reconstruction carried out the holder was, of course, out of commission, and as the smaller holders have only a capacity of 17,000 cu.ft. and our daily output is 40,000 cu.ft., a good deal of anxiety was experienced in keeping normal supplies to the district. Happily the contractors kept well to their promised time schedule, and the work went through without a hitch.

An interesting point emerged on an examination being made of the bottom ring of plates on the existing holder. These were carefully examined to make sure they were in fit condition to bear the new cup, and they were found to be in good condition with the exception of eight plates on the west side, all close together. These plates are close against the outlet pipe which had not been used since the holder was built in 1912 till last year. The only difference between the conditions on this side of the holder and the others is that four trees grow in close proximity and leaves find their way into the tank. Otherwise the inside of the holder was in excellent condition and the white lead sheet numbers were plainly visible. To guard against future corrosion at this point the inside bottom ring of holder has had one coat red lead paint and one coat red oxide.

Originally this holder threw 3·2 in. W.G. pressure, and, when the new lift is cupped, we have 6½ in. pressure at our disposal. This provides the opportunity of giving more satisfactory and uniform pressure to the district, and I consider the provision of unvarying pressure at the consumer's appliance a most important factor in trouble-free service. Variations in pressure can be more troublesome to the consumer than the slight variations in thermal value usual in gas manufacture.

The District.

The district supplied by the Company extends for five miles and embraces, in addition to Melrose, the villages of Darnick, Newstead, Newtown, and St. Boswells. It is almost entirely residential, and we have no industrial load unless hotels may be classified in that category. The villages of Newtown and St. Boswells are supplied by high pressure, the pipe line being four miles long of 3 in. diameter and the gas compression 5 lb. per sq.in. We find that 560 B.Th.U. gas is very suitable and presents few distribution problems if ample pressure is provided for the induction of primary air at the burner. About 40% of our output is distributed through this 3-in. main and if any drastic reduction were made in C.V. the Company would in all likelihood be faced with capital expenditure for the enlargement of mains and services. The length of the district presents its special problems in distribution, service to the consumer, and prevention of undue leakage.

Due to compression, the gas leaves the compressor at a temperature of 140° F. and is rapidly cooled on entering the mains so that practically all condensation takes place in the first two drip boxes which are close to the works. Thereafter no water is found, though the boxes are inspected twice yearly. What is more troublesome is the presence of fine oxide of iron particles which impinge on governor valve seats and impair their working. We have not yet ascertained the cause and remedy for this, but I propose to try spraying oil into the main to see whether

we can bring the dust to rest. The difficulty of rendering prompt attention to complaints and sales enquiries with a limited staff and an infrequent bus service was overcome by the purchase of a car, and this has proved of immense value, as it has brought the farthest limits of the district within ten minutes call. This is highly desirable, as I find that electrical competition is more serious and more difficult in meeting the farther the consumers are from the influence of the gas showrooms. To make our sales influence felt I have taken advantage of gas appliance manufacturers' travelling showrooms and have held gas cooking exhibitions in the different areas. It is fatal to allow gas to go out of fashion and I have kept consumers informed by addressing (with the aid of lantern slides) the various women's organizations in the districts and the local literary societies. It is surprising the amount of interest aroused at these evening meetings, and the business accruing has been very encouraging. Our electrical competitors have lately been following suit, but this is not disturbing so long as one is first in the field. Imitation is the sincerest form of flattery.

The prevention of leakage on a high-pressure main is rather difficult, and the problem is accentuated with the modern tarred roads which are practically impermeable; a further complication is the post office underground cable duct, which sometimes conducts escaping gas a considerable distance and makes detection and repair difficult. Three years ago the unaccounted-for gas figure stood as high as 22%, but we have now reduced it to 12% and hope to get it down to average proportions in the near future.

Meeting Competition.

Like the Gas Industry throughout the whole country the bulk of our attention throughout the past three years at least has been occupied with the meeting of competition, and you must forgive me if this Address seems to harp on that subject unduly.

Our sales staff is, of course, very limited, as is natural in a small undertaking. It consists of the Manager, fitter, and apprentice, but we try to make up for our numerical inferiority by throwing our whole weight and energy into the job of interesting our consumers. We have a hire purchase arrangement for modern enamelled cookers with oven control, and we have a ten years' hire purchase system of 4s. per quarter to suit the working classes and place the smaller type of modern cooker within their reach on the pay-through-the-meter system. Last year we sold for cash or hire purchase 97 enamelled cookers, and as in the previous two years 100 modern cookers were installed, we have the assurance that at least 20% of our consumers will not easily be persuaded to change their cooking fuel for some time to come. With regard to the lighting load we have a deferred payment scheme for the installation of switch, burner, bowl, pendant, &c., complete. We have a fixed price for the complete installation, and this is divided into four quarterly payments which are usually made through the coin meter rebate.

A rather important psychological point arose with these deferred payments. The Company's collector (from the Secretary's office) usually called in the past for these payments when collecting quarterly gas bills. I found that consumers did not like the neighbours to know they were buying on the deferred system; so arrangements were made to collect the instalments when on the meter survey, and thus the transaction was kept private—a variation on the "plain van."

Lighting Load.

Electrical canvassing is very common in this district, and electric light is the keystone of their sales talk. Once entry is obtained with lighting, the advantages of the tariff can be exploited to capture the other business at the expense of the Gas Company. To counteract this propaganda, a canvass of consumers in the area affected at the time was carried out by my fitter and myself, and in a housing scheme of 24 houses we got 16 orders for increased switch controlled illumination. This result was not achieved at one canvass. Our first attempt only yielded two orders, but the show we were able to make and the fact that the consumers did not fail to express their satisfaction to their neighbours gave us the sales result we desired. The most effective help a salesman can have is practical demonstration, and we try to get our consumers to talk and think of light and heat in terms of gas.

On our suggestion the Melrose Rugby Football Club fitted up a floodlighting arrangement on part of their pitch for training purposes, and the brilliant light is a good advertisement.

Two years ago we were able to make a reduction of 5d. per 1,000 cu.ft. in the price of gas, and last year we were in a position to concede another reduction of the same amount. The previous reduction in price had not acted as an incentive to the increased use of gas per consumer, and as our price would still be a high one notwithstanding the further reduction, close consideration was given to see if a more attractive method of charging could not be acted upon. We have on our books a large number of small consumers who are practically unremunerative when service and collection charges are considered, and a drop in the flat rate would make them more unremunerative still. In the course of investigating our accounts the interesting fact came to light that if every consumer paid a standing charge of 20s. per quarter gas could be profitably sold at 1s. 9d. per 1,000 cu.ft. This led me to consider the introduction of a tariff with a standing charge, but as this would require to be optional it was evident that only those consumers who would immediately benefit would take advantage of it, and we should be faced with a serious loss of revenue without a compensating increase in consumption, and, further, the task of selling the tariff to the smaller consumers would be a long and tedious one. It was, therefore, decided to put the block system of charging into operation, and the following scale was drawn up:

For the first 5,000 cu.ft. per quarter, 5s. 10d. per 1,000 cu.ft. (12·46d. per therm).

For the next 15,000 cu.ft. per quarter, 5s. per 1,000 cu.ft. (10·68d. per therm).

For gas used in excess of 20,000 cu.ft. per quarter 4s. 2d. per 1,000 cu.ft. (8·90d. per therm).

Consumers by coin meters are charged 6s. 3d. for the first 5,000, and thereafter 5s. and 4s. 2d., the same as ordinary consumers.

Railway Station Lighting.

The new system of charging has only been in operation about nine months and it would be premature to give a considered opinion as to its value; but it has proved of great assistance in selling additional loads such as water heating and it certainly forms a bulwark to retain large lighting consumers—and this brings to my mind the question of railway station lighting. All over the country one notices the conversion of station lighting from gas to electricity, and apart altogether from the reliability of gas lighting for a public service of this kind, the retention of such a load by a small undertaking like ours is rendered more difficult by what appears to me unfair discrimination. The Electricity Undertaking has its generating station in a nearby industrial town and has, therefore, the benefit of the preferential dross rate for its fuel transport. Although the Gas Company are in competition with them, this concession was refused to us, although we are the largest users of the railway in this town. In an effort to retain the business my Company offered free maintenance of the railway lighting, while the block system would have meant a saving of 15% in running costs. We were, however, unsuccessful. It is to be noted with satisfaction that the National Gas Council are now giving this matter their serious consideration, and a national effort is being made to induce the railway companies to extend the use of gas.

The production and marketing of coke plays a very important part in the manufacturing economics of a small plant in the heart of a residential area, and though one turns envious eyes occasionally on worry-effacing quick gas producing water gas plant, consolation can often be found in the valuable revenue produced by a good-quality smokeless fuel. Revenue from coke sales accounts for practically 40% of our coal bill, and we have a larger demand than we are able to meet. The only cloud on the horizon is the tendency of some of the merchants to purchase cheap coke from gas-works in the South and attempt to flood the market; but the formation of the proposed coke marketing scheme would, I hope, not only lead to the elimination of such unnecessary competition, but would also react to the benefit of the consumer in the form of a better article.

The time has come for a stronger co-operation between undertakings in a district. Some time ago my Company suggested to neighbouring concerns a co-operative advertising scheme in newspapers which served the districts supplied by the gas undertakings concerned; but boards are difficult to move in these matters, and nothing came of it. We have no purely local paper, but we use the good offices of the British Commercial Gas Association for local leaflet publicity and for stereos for programmes in local operatic societies, &c.

The advent of a National Gas Council Scottish Office will, I hope, lead to more local advertisement than the Industry can boast of at present.

The ironmonger's shop window is another avenue to sales which we have tried to utilize. Hitherto the only gas appliances shown were not so much gas appliances as pseudo gas-saving gadgets. To induce ironmongers to show a good class of appliances we offered full trade terms for sale or hire purchase, the Gas Company carrying out

the fitting free and supplying the appliances for show without cost to the vendor. We had a good deal of resistance to overcome, as the ironmonger usually sells oil, and, naturally, was averse to introducing a rival which would cut down his oil sales; and although one merchant has shown appliances, no sale has resulted so far.

Postal Publicity.

With regard to postal publicity, we find its pulling power is *nil* unless followed by a personal call. Last year we devised a sales letter drawing attention to the virtues of the modern enamelled cooker, and to make things as easy as possible we enclosed reply paid post cards with a printed request on the back asking the Gas Company representative to call. The total yield was two replies by post—and one of those turned out to be a thrifty person with a complaint! Fortunately, however, we had timed the posting of the letters in such a way that we should follow with a call in ten days' time for meter reading, and that survey yielded orders for 36 cookers. We now propose to turn our activities to water heating and shall follow the same procedure, which obviates the special services of a canvasser, though a more intensive selling campaign might follow after we have a nucleus of satisfied water heating consumers to refer to as a selling point against the more stubborn prospects.

In the course of this somewhat rambling Address might I be allowed to call the Industry's attention to what I consider is a serious drawback to the selling of low-consumption flueless gas appliances. I refer to the need for the provision of a cheap and effective method of removing sulphur compounds—not only is this essential if we are to eliminate the unsightly copper sulphur deposits on burners and pendants, but serious trouble can be experienced in bathrooms (which are usually poorly ventilated) through the presence of sulphur compounds unless the water heating appliance, no matter how small its consumption, is adequately ventilated.

In this district a new bathroom was built with three outside walls and two large windows facing north and south respectively. The bathroom was fitted in first-class modern style, and a 5,000 B.Th.U. per hour slow recovery gas water heater was chosen to provide the hot water. This appliance worked perfectly during the summer months, but when winter came along, with lower temperatures, excessive condensation on the cold walls occurred, and in the course of time the chromium-plated furnishings became tarnished, and in places the plating peeled off. The architect who designed the bathroom was informed that a gas fire to provide heat and ventilation in the bathroom was necessary, but his view was that it is most unusual to ventilate bathrooms. The trouble was overcome by ventilating the appliance; but this incident alone seems to point to the necessity for the complete removal of sulphur.

By their very nature gas companies are essentially local concerns with mainly local shareholders, and in small companies, at any rate, the directors are not of the semi-professional director class and are usually more interested in the practical development of their company than in the market quotation of its shares. That this has made for the welfare of the Industry is, I think, brought out in the excellent financial records which gas companies usually possess.

The incursion into the Industry of " big business " and of the financier director, is, I feel sure, of somewhat doubtful advantage, in spite of the promised improvements which are to follow amalgamations—improvements which for geographical reasons it is rather difficult to envisage.

In spite of the difficulties facing our Industry, partly due to increasing competition and partly due to ignorance of the possibilities and many uses for gas, it can, I am sure, easily justify its new title of " Public Servant No. 1," and will long continue to ease the labours and brighten the lives of the community.

Discussion.

Mr. D. Vass (Perth) said the coal situation had been particularly well described and in this connection he considered they should try to make the public understand that it was their business as well as that of the Gas Industry to see that gas undertakings were fairly treated. He also had similar trouble with dust in steel mains, and in Perth they were now installing dust traps to prevent the governors, &c., becoming choked. He considered this practice preferable to the use of oil for overcoming the dust problem. Regarding the corrosion of holders he had observed on opening a holder after being in use for ten years that the red and white lead markings painted inside gave better protection than the bitumen paint used on the inside surface of the holder. There was a need, he said, for research to discover the best protective material, and he advised Managers to take the opportunity whenever it arose of painting the inside surface of their gasholders.

Mr. A. Walker (Kilbarchan) considered that an opportunity for the furtherance of the use of gas occurred when maintenance work was carried out. A satisfied consumer was their best advertisement, and he further suggested that a water heater should be given to someone in a district at a very low price on condition that they advertised its advantages.

Mr. D. Fulton (Helensburgh) said that Mr. Gavin had always been noted for his clear thinking and commonsense. He considered that the Waverley Association, in providing a vehicle whereby young men like Mr. Gavin could show their mettle, served a most useful purpose. There was a family interest in this as in other addresses given to this Association which was not possible in the case of the larger Associations. He was interested in the advertising campaign carried on by Mr. Gavin, with the help of only one fitter and an apprentice. While praising them for being able to make such a successful effort he condemned the policy which prevented a more adequate sales staff. They were also handicapped in this way in Helensburgh; it was to the material advantage of small companies to have a suitable selling organization. He was convinced that Mr. Gavin would be disappointed with the results of his block system of tariffs and considered that a multi-tariff system with a low commodity price must be used to get increasing business. It was, he said, wrong to fix a charge of £1 per quarter per consumer without having regard to the size of the consumer. He sympathized with Mr. Gavin regarding his condensation troubles with water heaters. In Helensburgh they also sent out literature, but this was useless if not followed up by a personal call.

Co-operation with Ironmongers.

Mr. D. Walker (Rothesay) described a system he used to obtain the co-operation of ironmongers in which the profits for lighting fittings were pooled. Regarding the use of enquiry cards he said that in one year 250 of those kept by ironmongers had been returned to them with enquiries concerning appliances.

Mr. D. Melvin (Edinburgh) said Mr. Gavin had covered a very wide field, and he considered that his progressive policy with the introduction of modern cookers augured well for the future. He asked what the electricity charge was in Melrose. In Edinburgh it was 3d. per unit for 1st block and thereafter ½d. per unit, and they were able to hold their own against electricity. He considered it was wise to charge the prepayment and ordinary consumer the same price after the first step. He had also experienced difficulty with condensation when water heaters were fitted in unventilated rooms with tiled or painted walls. The ventilation of the heater should be so arranged that the correct draught should be exercised on the flame.

Mr. R. W. Cowie (Hawick) said he had also found white lead to give a good protection for the inside of the holder against corrosion. In 1930 they had erected a new holder and they had coated the inside surface with a mixture of red and white lead. He said Mr. Gavin was doing all the advertising possible with the staff available. In Hawick they had a large staff of fitters who also acted as canvassers and received commission for the sales effected. £3,000 was obtained in one year from the sale of burners, pendants, mantles, switches, &c., which was more than the receipts from the sale of fires, cookers, and other appliances. He had found that the demand for coke was very good, and they had increased the price by 3s. per ton to keep pace with the increased price of coal. This was the only way to recover the increase in the cost of coal unless the gas prices were raised and this would be undesirable. In his opinion undertakings should agree to a common selling price for coke. He also considered it desirable to have some co-operation in the gas advertising in the Border country and suggested that a lady canvasser and demonstrator should be employed for this area.

Mr. J. Richmond (Penicuik) was interested to learn that Mr. Gavin was a convert to rich gas. Internal corrosion, he said, should not occur in the case of rich gas since this would be prevented by the precipitation of liquid hydrocarbons. This oil would, however, cause trouble in syphons and governors.

Mr. Pratt (York) agreed that small undertakings should co-operate with ironmongers and plumbers. It was only natural, however, that the ironmonger should consider the effect of the introduction of gas appliances on the sale of his oil. He knew of similar instances of the unsympathetic treatment of gas undertakings by railway companies. In one case the gas company on losing the lighting load of the railway station had retaliated by having all their transport done by road and had actually found it cheaper. The railway company was informed that other gas undertakings would follow this example if similarly treated. He suggested that Mr. Gavin should consider road transport.

The President Replies.

Mr. Gavin said he was very gratified that his Address had evoked so much discussion and thanked the members who had participated. He said that like Mr. Vass it was in steel mains that they had experienced trouble with dust. He was surprised to hear from Mr. Richmond that rich gas should not cause corrosion. He was in agreement with Mr. Fulton regarding the inadequacy of his sales staff, although there was one saving factor—namely, that they could maintain an intimate personal touch with the consumer. Mr. Fulton had misunderstood him regarding the reference made in his Address to a tariff with a standing charge of 20s. per quarter per consumer. This was merely an observation, and he would not suggest that a fixed standing charge for every consumer regardless of the

size of that consumer should be made. In reply to Mr. Melvin, he said that in Melrose it was difficult to obtain the price of electricity since it was altered frequently; but it was somewhere in the region of a flat rate of 8d. per unit, or a standing charge of 25s. per room per annum and 1d. per unit for all electricity used. They had no fear of competition from electricity for the cooking load. Only three electric cookers had been installed in Melrose, and one of those had now been replaced by gas. He agreed with Mr. Cowie that it would be a wise move to have some co-operation among the Border gas undertakings and to appoint a lady demonstrator and canvasser for the whole district. He said he would consider Mr. Pratt's suggestion to discover if road transport would be possible.

Gas Undertakings' Results

Arbroath.

The annual report to the Arbroath Gas Committee by the Gas Manager, Mr. D. Morton, shows that there is a debit balance of £1,346 for the financial year after meeting the various items in the Appropriation Account. The net income from residuals was £4,860 15s. 6d.; coal carbonized 12,468 tons; and total quantity of gas made 224,464,000 cu.ft.—an increase of 12,682,000 cu.ft. over last year's output. The average yield of gas per ton of coal carbonized was 18,003 cu.ft., equal to a production of 81·14 therms per ton. It was added that the estimates for next year's working were based on the price of coal contracted for, and the current price for residuals, and these considerations necessitated an increase, which would also be applicable to the special rates for gas used for industrial purposes. It was agreed that the price of gas for the current year, with the usual rebates to large consumers, be as follows, viz.: Ordinary consumers 6·6d. per therm, equivalent to 2s. 6d. per 1,000 cu.ft.; slot meters 7·5d. per therm, equivalent to 2s. 10d. per 1,000 cu.ft.

Bolton.

The gross profit for the year ended March 31, 1936, is £60,041, an increase of £3,566 over last year. Of this amount £3,067 has been allocated as Revenue Contribution to Capital Account. The income this year from gas is down by £1,006 from last year's figures. The residuals market is slightly better and in consequence the income from residuals is up by £1,901. The alteration to the scale of charges, which offers concessions to the consumer, has resulted in increased sales of gas and since the alteration applied only from September, 1935, it is reasonable to assume that the improvement will continue in the coming year. In the residual market, coke sales show an improvement and tar sales are maintained. The improvement in the manufacturing cost has shown results which, however, may be offset by the increasing cost of coal during the coming financial year.

Guernsey.

The balance at credit of profit and loss account of the Guernsey Gas Light Company, after paying the interest on debenture bonds and making the allocations shown in the accounts, amounts to £18,290. The Directors have fixed the dividend at 17s. 6d. per share, which will absorb £7,000 gross, leaving a balance of £11,290, which, owing to the present unsettled condition of the coal market and to the fact that legislation now being considered by the English Parliament may affect existing coal contracts, the Directors have decided to carry forward. The sale of gas during the year was 224,467,300 cu.ft., an increase of 14,941,100 cu.ft. over last year, while the number of consumers has increased by 665, making the total at the year end 8,126, a record result. The Company have extended their mains a total distance of 9,214 yd., making the total length of mains at the year end 75 miles. The beneficial result of this extension of mains is reflected in the record increase in gas sales. In order to meet the continued growth of the Company's business, the Directors have decided to extend the retort bench by the erection of three additional beds of eight retorts, which will then completely fill the existing retort house, and should give adequate retort capacity for a number of years.

Holyhead.

The Directors of the Holyhead and North Wales Gas Corporation submit a Report for the year ended March 31, 1936, which states that gas sold shows an increase of 542,100 cu.ft. for the year, which the Directors consider very satisfactory. The cost of repairs and keeping the Works in order is £3,542, and the net profit for the year is £4,376. The Directors recommend that a dividend at the rate of 4½%, less tax, be paid for the year ended March 31, 1936, and that the sum of £1,000 be transferred from profit and loss account to reserve fund account.

Lincoln.

The report upon the accounts of the Lincoln Gas Undertaking for the year 1935-36 states that the year's working shows a gross profit of £21,212, which, less service of debt and interest charges amounting to £19,566, leaves a net profit of £1,646. The year's income was £108,866, and the working expenses were £87,654. The income from sale of gas shows an increase of £4,508, which is chiefly due to the learge increase in the industrial load. Residuals also show a satisfactory increased profit of £4,835. The profit on appliances sold under hire purchase terms is £4,761 less than in the previous year. The number of consumers supplied through prepayment meters is steadily growing, there being 12,942 at the end of March last, of which 1,072 are outside the City boundary, compared with 12,489 at the end of the previous year—an increase of 453. The gas production for the past year was 634,716,000 cu.ft., an increase over the previous year of 63,445,000 cu.ft. This increase is by far the largest in the history of the concern, and is chiefly due to the industrial load. As already indicated to the Committee, owing to the rapid increase in the industrial furnace consumption, in the near future, it will be necessary to consider additions to plant. The indications are, that in the next two years, the consumption will increase in the neighbourhood of 50% of our present output. The new benzole plant which was put into operation in June last is giving very satisfactory results, and proving a valuable addition to the revenue. Length of mains has been increased by over 6 miles. The total length now being 125 miles, 1,643 yds., and the distance from one end of the main to the other is over 10 miles. It is proposed to install a new 12 in. high-pressure main from the Bracebridge Works to Monks Road area. The value of appliances and fittings sold during the year was £18,528.

Lisburn.

The gross profit on the Lisburn Urban Council's gas undertaking for the year was £5,710—an increase of £446 as compared with the previous year. The net profit was £1,947 compared with £919.

Oldham.

On June 3 the Commercial Manager of the Oldham Gas Department (Mr. E. Parry) reported at the meeting of the Committee that the gross revenue for the past year was £277,646, and the gross expenditure £208,909, leaving a credit balance of £68,736. From this had to be deducted a sum of £39,153, representing the cost of annuities, interest on loans and stocks, and sinking fund, leaving a net profit of £29,583. From this had to be paid £4,000 in relief of the rates.

Primitiva Holdings.

At the Seventh Ordinary General Meeting of Primitiva Holdings, Ltd., held at Winchester House, Old Broad Street, London, E.C., on May 25, the Directors' Report and Accounts for the year ended April 30, 1936, were adopted and a dividend at the rate of 3% for the year (less income-tax at 4s. 9d. in the £) declared on the ordinary stock of the Company. The general reserve has been increased from £30,000 to £37,500 by the allocation of £7,500 from this year's profits. The Company's principal assets are their investments in subsidiary companies, which stand in the books at approximately £2,400,000. The net profit is up by £3,182 to £78,158. The increase is due to additional income received from investments in subsidiary companies. The operations of their principal subsidiary, the Primitiva Gas Company of Buenos Aires, Ltd., during the past year, show that the capital account has increased by some £57,000, the principal expenditure under this heading being in respect of extensions of mains, services, and meters. The number of consumers has increased by 6·53% to 94,666, while gas sales have gone up by only 1·3% to 63,704,000 m³. This is accounted for by the fact that sales per consumer have again decreased, partly on account of economies by consumers and also on account of the greater efficiency of gas appliances.

South-Midland Gas Corporation.

The report of Directors of the South Midland Gas Corporation, Ltd., for the year ended March 31, 1936, states that the profit available to be dealt with by the Company in General Meeting is as follows: Balance brought forward from last year £44, add profit for the year, after charging income-tax and all other expenses, £3,471, making a total available for appropriation of £3,515. From this has been appropriated: The dividends paid on the preference shares amount to £1,355, and the interim dividend paid on the ordinary shares for the six months to Sept. 30, 1935, £794, leaving a balance of £1,366, which it is recommended be appropriated as follows: Final dividend on the ordinary shares at the rate of 5½% per annum for the half-year £863, reserve for premium on redemption of preference shares £20, and in writing off goodwill of the Eynsham undertaking £200, leaving, to carry forward to next account, £284. The final dividend on the ordinary shares recommended, together with the interim dividend already paid, make a total dividend for the year of 5½%.

Comparative Costs of Gas For the Artisan User

by
S. C. LESLIE
(Publicity Manager of the Gas Light & Coke Company)

From a Paper presented on May 26 on behalf of the B.C.G.A. at the Inaugural Conference on Lighting, Space Heating, and Hot Water Supply in Low-Cost Housing, held at the Housing Centre, Suffolk Street, S.W. 1, under the Patronage of the Rt. Hon. Sir Kingsley Wood, Minister of Health.

This Paper contains a certain amount of material bearing upon the costs of using gas for lighting, cooking, space heating, and hot water supply in working-class flats and houses, and some comparison with the costs of other types of fuel. The facts and figures now available fall under two main headings—first, what may be described as laboratory figures, and second, figures based upon actual experience. The first type rest upon a theoretical determination of the actual efficiencies in use. The second are drawn from the records of actual fuel consumption in groups of working-class dwellings. Both types of figures need to be approached in a critical and vigilant frame of mind—the laboratory figures of efficiency because of the many modifying circumstances that actual practice may introduce into a theoretical picture, and the figures of actual consumption because of the enormous variety of social, economic, and human circumstance that may have affected the figures in unseen ways.

Lighting.

A recent investigation at one of the Gas Industry's research centres compared a number of standard mantles with equivalent electric bulbs, from which it appeared that in order to compare with gas at 10·7d. per therm (which is the normal rate of charge for tenants of low cost dwellings in the greater part of London and which includes the hire charge for certain apparatus) electric current would need to cost about 3d. per unit. It has been suggested that in view of the more practically useful distribution of the light from a gas mantle a fairer equivalent for electricity would be 2½d. per unit. This omits all reference to the comparative cost of electric bulbs and gas mantles, it being well known that the higher price of the former gives a very great advantage to gas lighting among large numbers of poorer families.

Some further figures that may be of use are available in the shape of attempts to estimate the annual consumption of gas for lighting in an average working-class household by combining laboratory knowledge of the efficiency of gas for lighting with well-informed estimates of the number of hours when lighting would be in use. The resulting figure suggests that from 20 to 35 therms per annum represents the normal limits of the gas lighting load in low cost dwellings.

It must be remembered that the value of gas lighting as a heating medium is an important part of its attraction for the poorest classes of consumer. The coming of catalytic ignition means that gas lighting like electric can now be controlled by a wall-switch.

Cooking.

Similar attempts have been made to estimate the normal gas cooking load, which indicate that from 75 to 80 therms per annum represents the average consumption for cooking in working-class households. This would mean a cost of about £3 10s. per annum, or, say, 1s. 4d. per week. The results of 21 independent investigations made into the comparative costs of cooking by gas and electricity (14 were in America, 3 in England, 2 in Germany, 1 in Switzerland, and 1 in France) expressed in terms of the equivalent price of electricity to gas at 10·7d. per therm, range between 0·38d. and 1·0d. per unit—there being a fairly even spread of results all the way between these two extremely diverse figures. Though this spread may be affected in part by the different types of cooker in use in different countries, discrepancies indicate the great need of careful examination of the whole question.

An average, in the case of so many different figures, is itself not very significant, but for what it is worth the average of all these tests works out at 0·74d. In considering this figure, several things should be borne in mind. One is that the price of 10·7d. per therm includes 2d. per therm to cover the costs of a statutorily prescribed amount of gas carcassing and the provision of a gas meter *and cooker*. If the cost of gas alone is reckoned (8·7d. per therm), the average of all the investigations above mentioned would show a comparable cost figure for electricity of 0·6d. per unit.

It must be mentioned too that nearly all tests are carried out with new cookers, and since it is claimed that the deterioration of efficiencies is very much more rapid in the case of electric than of gas cookers, the practical working comparisons would be more favourable to gas than the special test.

Another thing to be borne in mind is that the comparison between gas and electricity varies very much for different cooking processes. The relative efficiency of gas compared with electricity is at its highest for the use of the burners at the top of the cooker—for boiling and frying. It is a matter of experience and observation that the relative use of the hotplate (*i.e.*, the boiling burners) in working-class households as compared with the use of the oven is very much higher than it is in households with a larger income. An estimate made in the Gas Industry is that 60% of the gas used goes through the boiling burners, 20% through the griller, and 20% through the oven. The figures would probably be very different for a different type of consumer, but in many working-class households the oven is used little more than once a week, for the Sunday roast. The lowest figure of all the tests above mentioned (*i.e.*, the one most favourable to gas) was 0·38d.—the outcome of a test between hotplates alone. In considering working-class housing costs this is an important and practical point.

One of the most recent attempts to deal with the cost of cooking comes from the Engineers' Study Group on Economics, whose estimate is apparently based upon laboratory test conditions with an allowance of 25% for wastage under ordinary domestic circumstances. Allowing for meter rent, their figures are: Gas (at 8·6d. per therm), £3 per annum; electricity (at 0·625d. per unit), £4 14s. per annum.

The claim made by gas research institutions is that a therm of gas is the equivalent, for cooking purposes, of 20 electrical units on a new electric cooker and 25 units on one subjected to average use. The 20-unit figure means that to equal gas at 10·7d. electricity should cost 0·4d. per unit excluding standing charges; and the offer is made to conduct a test, and to prove this result, under impartial public supervision.

Finally, it must be pointed out that all the above comparisons are made on the assumption that full advantage is taken of the high speed and exact controllability of the gas burner. Costs of gas cooking could be substantially reduced by lowering the flame to give a speed equal to that obtainable from some other fuels.

Space Heating.

An estimate from the Gas Industry of the number of therms per year used in the average gas fire in a working-class household is from 12-15. But in this instance an average figure is particularly unreliable because of the wide divergencies between the amounts of use made of the fires that are installed.

Turning to the subject of cost comparisons, it is necessary to distinguish between the case of a flued gas heater, where there is a considerable loss of heat energy through the removal of products of combustion, and a flueless heater where almost the whole of the heat produced is available in the room. In the former case the price of electricity which would make it exactly equivalent in cost to gas would be 0·7d. per unit, while in the latter case its price would need to be 0·38d. per unit.

It has sometimes been assumed that the cost of gas and electricity puts them out of court for continuous space

heating in low cost dwellings and confines their economically practicable use to intermittent heating. In this connection, however, it should be borne in mind that a different state of affairs arises where a two-part tariff is in operation with gas at some such figure as 4d. a therm. In such an event, particularly for purposes where flueless heaters and radiators are in use, the economic position is obviously entirely altered, and space heating by gas becomes no more expensive than by a coal fire.

Water Heating.

Under this heading one main question is the amount of hot water thought to be necessary. For full use, from a multi-point system it has been suggested that 200 therms per annum are a proper quota—meaning an actual cost for gas at the two-part tariff rate for automatic consumers of about £5 per annum. This is a high estimate, however, and normally consumption in low cost dwellings is much less.

The Engineers' Study Group above referred to sets the normal requirements of a family of four persons at 50 gallons per day raised 80° F., including an allowance for wastage. Actual costs on this basis would be:

	Per Annum. £ s. d.
Coke	3 6 0
Gas at 8·6d.	6 5 0
Electricity at ½d. per unit	11 1 0

To enable electricity to compete on equal cost terms with gas its price would need to be 0·35d. per unit, reckoning from the cost estimates just given.

In those parts of the country (and they include the greater part of London) where a two-part tariff is in operation and gas is available at 4d. per therm, excluding standing charges, the existence of this tariff becomes an important factor where water heating is in question. The use of gas for this purpose much increases the probability that the tariff will make an appeal to the individual consumer on grounds of economy. Reckoning gas at 4d. per therm and excluding standing charges (after the manner normally employed in quoting and reckoning electrical charges) a generous allowance of hot water per family such as that made by the Engineers' Study Group would mean an average annual cost of just over £3, comparable with the cost if coke is used, and meaning that no extra charge is paid for the automatic, labour-free features of the gas system.

Turning now from this very summary review of the position with regard to assumed or estimated costs under the various headings, a brief reference may be made to costs as shown by actual experience. Figures have been obtained of the average consumption of gas and the bills for gas consumed at 10·7d. per therm in some 30 blocks of flats, including 1,659 individual flats, in London. It is impossible to give here the figures for each individual flat in the various blocks, but if these figures were given, very wide differences of consumption between flats similar in size and extent of equipment would be noticed. The same sort of anomaly is apparent from the average figures, where wide differences occur between the average figure for two given blocks of flats of similar type and with the same equipment. These differences point once more to the need for very great vigilance and caution in coming to general conclusions and in making general comparisons. But with all reservations of this sort made, it may be pointed out that an average figure of cost per annum for those blocks of flats equipped with a gas cooker, gas copper, or bath heater, and one fire, would appear to be something under £5 (gas at 10·7d.). The average cost for those flats which were equipped with a cooker alone, on the other hand, appears to be something over £4. To attempt to explain this anomaly, for such it is, without a detailed enquiry into the individual circumstances would be a waste of labour, though it may be suggested as a possibility that the hot water needs of the second group were met in part by the gas cooker, both for kitchen and bathroom use.

* * * * * *

Perhaps it may now be possible to sum up in general terms, not upon the question of gas costs or comparisons with other types of fuel in low cost housing, but upon the point which is the main subject matter of this Paper—namely, the complexity of the whole problem and the need for a really enlightened and unbiased approach to it, an investigation which the Gas Industry would be the first to encourage.

Among the extremely important aspects needing to be borne in mind in any review of an innocent-looking set of figures are the following, some of which have already been mentioned:

(1) The difference in social and culinary habits between working-class households and others, with its bearing on such matters as the use of ovens and hotplates and the resulting expenditures of fuel, the heat value of gas lighting, the use of a cooker to provide hot water, &c.

(2) Comfort and convenience factors of all kinds, typical among which may be taken (i.) automatic cooking—the possibility of setting an oven at a required speed so that it may be left and a dinner cooked at a given time—and (ii.) the adaptation of water heating to particular types of need by the choice between instantaneous and storage methods.

(3) The factor of what may be described as service. It should be borne in mind, in reckoning the costs of using various types of gas appliance, that among the equivalent values given is instruction to the household in the best and most effective manner of use. This is particularly important in cooking. Instances are common where large groups of tenants, newly housed in blocks of flats, find themselves confronted for the first time with fuel on tap. Hitherto their cooking has been done on coals or possibly on sticks. The Gas Industry makes it a part of its business to give these tenants the necessary lesson in the use of the unfamiliar appliance—and also, by lessons in the home and demonstrations in the showroom, to improve the efficiency standards of those to whom the gas cooker is not a novelty.

(4) The fact that in figures that may be put forward showing fuel costs in low cost dwellings, very varied methods of showing or not showing capital charges may be adopted. There is need to take into consideration standing charges and not to reckon solely in terms of the flat-rate portion of a two-part tariff. Vigilance here is all the more necessary where, as in many instances, the standing charges are not actually presented to the tenant to be paid but are concealed in the rent of the flat or dwelling. It is obvious that while the tenant may thereby be happier the economist cannot allow himself to be deceived.

It has sometimes happened, too, that hire charges for equipment have been included as part of the rent.

(5) The many regional peculiarities arising out of climatic differences, variations in industrial method (such as hours of working or sex of employees) and sheer inexplicable local habit. In parts of the North, for instance, home oven-baking is common—in the South, almost unknown. In the mill towns a higher proportion of women work away from home. In the South the habit of eating out is commoner. Hardness of water may affect cooking and water heating costs. Average temperature obviously affects space heating.

(6) The detailed circumstances of individual households or blocks of households in respect of which cost figures may be put forward. As a sidelight it may be mentioned that fuel costs for a block of flats in which there may happen to be a rather larger number of people than usual who take in washing will be distorted to such an extent as to offer a pretty riddle to anyone who does not guess the explanation.

These last considerations bring up one final and extremely important point. The case for exact and impartial research into the economics of fuel consumption in working-class dwellings has already been sufficiently stressed. There is need, too, for another type of research—namely, research into domestic habits, circumstances, and needs—if this problem is to be approached, whether by architects, economists, or any others, in a practical and not a dry-as-dust abstract fashion. The technique of ascertaining and recording in measurable fashion not merely the daily habits but actually to some extent the attitudes and ideas of large numbers of people have been carried to a very fair point of efficiency, and it is suggested that what is called (perhaps a little cold-bloodedly) consumer research should definitely engage the attention of this Centre in relation to the problem now under review.

Would it not be a right and proper thing for housing authorities in general to group themselves together to clear up, by research of the various types that have been considered, the numerous points of national importance at present remaining uncertain? It is not the function of this Paper to offer a suggestion as to whether this research work should be carried out by regional groups of housing authorities or by the Ministry of Health itself, or in some other manner, but it is clear that if the question of a national housing policy is to be approached seriously and professionally, some such course of action is necessary.

North of England Gas Managers' Association

(Auxiliary Section)

Meeting at South Shields

June 19, 1936

The Auxiliary Section of the North of England Gas Managers' Association paid a visit to South Shields on June 19, when Mr. J. R. Porter, Works Manager of the South Shields Gas Company (Chairman of the Section), delivered his Address before a very good attendance.

Mr. W. A. PICKERING (Secretary of the South Shields Gas Company) welcomed the members to the Borough, and said that they all regretted the absence of Mr. Dugald Currie, the Company's Engineer, who for the past three months had been unable to attend to business owing to illness. It was agreed to write to Mr. Currie and wish him a speedy recovery.

CHAIRMAN'S ADDRESS

BY

J. R. PORTER,

of the South Shields Gas Company.

Gentlemen,—I wish to express again my deep appreciation and thanks for the high honour which you conferred upon me at our last Meeting in electing me as Chairman of this Section of the Association for the current year. I assure you that I shall endeavour to maintain the high standard which my predecessors have established, and uphold the splendid traditions of the Association, to the best of my ability.

As this is the first visit of this Section of the Association to South Shields, and it is intended to visit the Gas-Works at a later stage, I purpose giving as the subject matter of my Address a general description and a few details of our activities at the South Shields Gas-Works in the hope that they will be of interest to the members generally.

At the outset, however, I must state that there is nothing particularly novel to be found in connection with the Works, but it will be seen later that the plant and apparatus is of approved type, arranged to the best possible advantage considering the restricted ground space to provide an economical and reliable supply of gas and coke to our consumers.

The Works are situated practically in the centre of the town, adjoining the St. Hilda Colliery of the Harton Coal Company from whom all our coal supplies are obtained.

The coal used is unscreened Durham coal and is brought to the Works in 10-ton capacity bottom door wagons over a private elevated siding which runs over the storage cells next to the retort house.

The railway sidings are situated about 32 ft. above the Gas-Works yard level and coal from the wagons is dropped into a 120 ton capacity concrete receiving cell which feeds the breaker. The coal-handling plant comprises an arrangement of duplicate four-roll breakers and bucket elevators, one at each gable end of the retort house, with a reversible band conveyor running along the ground floor adjoining the storage cells for feeding coal into either breaker.

A reversible push-plate conveyor extends the full length of the retort house over the elevated steel plate coal hoppers, and receives coal from either of the elevators. One of the elevators is driven by a gas engine and the other by a steam engine; and an arrangement of gearing and clutches enables the coal conveyors to be worked from either elevator.

The elevated steel plate hoppers inside the retort house have a capacity of 290 tons, and extend the full length of the building. The hoppers have V-shaped bottoms and are provided with sliding doors which are operated from the platform of the stoking machine.

MR. J. R. PORTER.

Mr. J. R. Porter entered the service of the South Shields Gas Company under the late Mr. T. H. Duxbury, receiving his early training in the drawing office during the extensive reconstruction of the Shields and Jarrow Works. Subsequently, after serving as Carbonizing and Works Superintendent, he was appointed, in 1926, to his present position of Works Manager of the Shields and Jarrow Works. Mr. Porter possesses the City and Guilds Final Grade Certificate in Gas Engineering, and was elected Assoc.M.Inst.Gas E. in 1927.

The Retort House.

The retort house is 150 ft. 6 in. long by 56 ft. wide and contains ten settings of Drakes horizontal through retorts, each setting having ten D-shaped retorts in two vertical rows, the retorts being 24 in. by 18 in. in section and 20 ft. in length.

Each retort carbonizes a 16½ cwt. charge in 12 hours, and the ten settings are capable of producing 2,250,000 cu.ft. of 480 B.Th.U. gas per 24 hours when using unscreened Durham coal. The working temperature in the combustion chambers averages 1,380° C. and daily readings are taken by means of a Cambridge optical pyrometer. The operations of charging and discharging the retorts are carried out by means of a Drakes combined stoking machine. The machine is electrically driven throughout, each motion having a separate motor of British Thomson Houston Company's make. The rotor fan charger is driven by a 17 b.h.p. motor running at 560 to 1,250 r.p.m.; the ram motor being 10 b.h.p. at 575 r.p.m. The travelling and hoisting motors are each of 7 b.h.p. at 545 r.p.m.

It is our practice after each shift to run the ram out for inspection on a steel plate hinged table in sections which is fixed to the buckstays at the end of the retort bench. The retort settings, as originally installed in the years 1923-24, were of fireclay material, but owing to the heavy charges and the high heats necessarily adopted, these proved to be unsatisfactory; the retorts lost their shape through softening of the material and considerable difficulty was experienced both in charging and discharging them.

After successfully experimenting with silica material it was decided to reset the retorts, as they became due for renewal, in tongued and grooved segmental Consett silica. The silica material was first tried about ten years ago and our experience with it confirms the expressed opinion of others who have successfully used the material. It has proved to give a longer life than fireclay under conditions such as exist at these Works, and, furthermore, the material keeps its shape and has a definitely higher thermal conductivity which enables us to work the heavier charges and thus obtain an increased throughput.

The difference in cost between that of a setting in fireclay and one constructed of segmental silica retorts is approximately £20, which extra cost is negligible compared

with the extra life and greater throughput obtained. The settings are divided into two benches, each bench containing five settings, with the chimney interposed between the benches. The main flue passes through the centre of the benches and is provided with a continuous division wall running through the centre to separate the gases from the front and back of the settings. The pull on the main flue is controlled by an automatic draught regulator fixed near the bottom of the chimney. The furnaces are built-in step grate type with rectangular tubular regenerators. The retorts are provided with 7 in. internal diameter cast-iron ascension pipes at each end.

The hydraulic mains are supported on cross girders between the buckstays and are constructed of mild steel with division plates between each setting; they are also provided with curtain plates to facilitate cleaning, but it is of interest to note that even after long periods there is very little accumulation of deposit. Stopped ascension pipes are also very rare, but it is the practice to auger the bottom of the pipes at each discharge of the retorts to remove the thin crust which forms near the mouthpiece.

The foul mains run along the centre of the benches with 10 in. branches on each side connected to each section of hydraulic main. Each bench is provided with four tar towers, two at each end, the towers being connected to the hydraulic mains by 8 in. diameter tar mains. The design of the towers is such that the tar can be run off without disturbing the seal of the dip pipes, no exact regulation of tar run-off or liquor feed being required. Braddock's Retort House Governors are fixed at the end of each bench and are regulated from the stage floor level by means of an extension from the lever arm of the governor.

The calorific value of the gas made is recorded on a Simmance Calorgraph situated in an instrument room in the retort house. The instrument room also contains dead beat indicators which show at a glance the pull on the inlets of the exhausters and the retort house governors, and also the total back pressure on the exhausters.

Simmance recorders are also provided to give a continuous record of the pull at the hydraulic mains.

Coke Handling Plant.

Hot coke from the retorts is directly handled by telpher inside the retort house. The coke is discharged into a specially constructed skip which takes the coke from two retorts at a time.

During the discharging operations, the coke is hand sprayed by the stokers, flexible water connections being arranged at suitable spacings along the retort house wall. Quenching tanks are provided at each end of the retort house, the quenching operation being carried out by slowly immersing the bottom of the skip into the water and holding the skip in position until the steam evolved has completed the quenching of the whole contents. All the water used in coke quenching and cooling of the producer stepgrates is obtained from a well 90 ft. deep, which is fed from an underground spring. The excess water is recovered and filtered for storage in an underground tank which was formerly the tank of a disused gasholder.

A Lee-Howl horizontal pump raises the water from the storage tank into an elevated cast-iron tank situated above the exhauster house wherefrom sufficient pressure head of water is obtained for the retort house requirements.

The motors and gearing of the retort house telpher are arranged above the driver's cabin, which arrangement has proved most satisfactory as the motors are protected to a certain extent from the steam evolved during the quenching process. The quenched coke is tipped from the skip into either of two receiving hoppers which feed the reciprocating screens and cutting machine and rotary screen plant respectively.

The telpher track is straight and is composed of 3 in. by 3 in. by 30 lb. per yard flanged rails on 14 in. by 6 in. by 46 lb. per foot rolled steel joists, the total length being 280 ft. As the telpher has only a short journey to the quenching tank and hoppers, this system of handling the coke does not cause any delay in the operations of the stoking machinery.

Coke in the storage yard and bunkers is handled by means of an elevated steam crane running over concrete storage cells adjoining and extending the full length of the retort house. The crane track is extended at one end to run over the steel plate coke hoppers; this arrangement enables the crane to handle coke from any of the hoppers or deliver coke to the screening plants.

A high level telpher track runs at right angles over the retort house telpher and extends over both yards of the Works, which is divided by a public street. The high level telpher track is equipped with a 3-ton capacity Strachan & Henshaw machine; by this means coke can be loaded from the yard level into trucks on the elevated siding at the rate of 30 tons per hour. The high level telpher crossing the public street conveys breeze to the boilers, as well as purification and other materials to that part of the Works.

The screening plants consist of two double-decked cascade jigging type screens working independently of each other, and one rotary screen incorporated with the coke cutting plant. The cascade screens are situated over the hoppers and are driven by separate 5 b.h.p motors. The screens are set at an angle of 10°, the screening portion being formed of cast-iron tapered finger plates which regulate the size of the coke passed over the screens. A mild steel firebrick lined receiving hopper is constructed above the screens, the coke being fed to the screens by reciprocating feeders.

Until about four years ago, all the coke was dealt with by the cascade screens, but owing to the increased demand for broken coke for household use, it was found necessary to install additional plant to cope with the orders received.

As space is much restricted in these Works, a great deal of thought and careful planning is required before deciding on any new erection, but eventually a suitable arrangement was adopted and a 15 tons per hour Cort's cutting and rotary screening plant was installed. The plant was completed in November, 1931, and has since proved entirely satisfactory and well worth the outlay. A mild steel brick-lined receiving hopper measuring 14 ft. by 12 ft. is provided, which can be supplied with coke direct from the retort house or by means of the steam crane or high level telpher.

Coke from the receiving hopper is fed by means of a reciprocating type feeder into a Cort's No. 15A cutter fitted with manganese steel cutters, capable of adjustment for varying the size of cut coke and taking up wear on the cutters. The cutter and reciprocating feeder are both driven by a 12 b.h.p. totally-enclosed fan-cooled motor.

The machine-cut spur reduction gearing of the cutter is enclosed in a dust-tight sheet metal case, the machine-cut gearing connecting the cutting rolls being enclosed in a dust-tight oil bath case. Beneath the cutter is arranged a mild steel chute which delivers the coke direct to an elevator. The elevator is of the continuous tray type, fitted with mild steel trays, 18 in. wide, $\frac{3}{16}$ in. thick, with $\frac{1}{4}$ in. thickened lips attached to $1\frac{3}{4}$ in. by $\frac{3}{8}$ in. mild steel flat skidder bars which are fitted with cast-iron wearing ends. The trays are mounted on a 12 in. pitch malleable iron chain of 4,000 lb. working load, fitted with renewable high carbon steel bushes. The tension of the chain is effected by means of adjusting screws incorporated with solid type bearings at the lower end of the chain.

The elevator is approximately 36 ft. long between centres, with lattice braced framework, the main or runner members being fitted with $\frac{1}{16}$ in. thick high carbon steel renewable wearing strips where the skidder bars engage.

The discharge chute at the elevator head delivers at right angles, and is constructed of $\frac{1}{4}$ in. thick mild steel plate and provided with $\frac{1}{4}$ in. thick renewable bottom wearing plates, the troughed back of $\frac{1}{8}$ in. thick mild steel plate being arranged for easy detachment. The coke discharges into a 40 in. internal diameter dual friction driven rotary screen, the cylinder having an overall length of 13 ft. The screen is fitted with one section of woven high carbon steel wire, $\frac{3}{4}$ in. mesh by 6 W.G. with a dead plate at the delivery end for trimming the large bunker.

The driving shafts are carried in solid type grease-gun lubricated bearings, the shafts being coupled through a roller chain enclosed in a dust-tight case.

One of the side shafts is extended and coupled by means of a universal joint to the driving shaft, driven through totally enclosed worm reduction gearing by a 5 b.h.p. totally-enclosed fan-cooled motor which also drives the elevator.

The coke and breeze bunkers are constructed throughout of $\frac{3}{8}$ in. thick mild steel plate, the supporting structure having 10 in. by 8 in. rolled steel stanchions with 8 in. by 3 in. rolled steel channel section transverse members. The breeze hopper has a bottom opening and a side chute for filling into skips, each opening being provided with rack and pinion operated doors. The coke bunker compartment is provided with four bottom doors and four side chutes; rack and pinion doors are arranged on each outlet as well as cut-off valves on the side chutes. A Belle Isle deadweight weighing machine with hopper container is arranged under one of the side chutes for weighing 1 cwt. quantities of coke into bags. With this machine it is possible to bag coke at the rate of four bags per minute, the work being performed by two men.

Catering for Local Coke Sales.

Every endeavour is made to increase the local sale of coke by specially catering for the domestic household trade, and the results obtained in this direction have been most satisfactory. Any order of 1 cwt. or upwards of coke in bags is accepted for delivery by the Gas Company's vehicles, second-hand twill bags being used; each bag costs

fourpence halfpenny and lasts on an average about thirty-three times before being discarded.

Under the South Shields Corporation Act of 1935, the sale of coal by-laws now apply in all respects to coke, and it is necessary for our vehicles to carry weighing apparatus for the sale of quantities not exceeding 2 cwt.; the type of apparatus carried by our vehicles being the Avery dead-weight equal balance machine of 2 cwt. capacity, complete with the necessary weights.

Electricity Generating Plant.

All the electricity used in the Works is generated by means of self-contained gas engine driven units. The plant, which was installed in March, 1923, comprises two sets of direct-coupled D.C. generators, each having an output of 54 kW.

Each generator is capable of supplying the whole of the present electricity requirements, and the machines are arranged to work so that one set supplies the day load, the duplicate set dealing with the night load. The engines are horizontal single cylinder National gas engines, 16 in. bore by 23 in. stroke, each capable of developing 85 b.h.p. at a constant working load and 95 b.h.p. maximum for half-an-hour at a speed of 210 r.p.m. when running on town gas of 475 B.Th.U. gross calorific value per cu.ft.

The gas consumption on the basis of 475 B.Th.U. gross calorific value is rated as follows:

Maximum load	15,600 B.Th.U. per kW hour
Full load	14,900 " " "
¾ load	16,000 " " "
½ load	18,000 " " "

Separate 300 light meters are provided for measuring the gas used by each engine.

The speed of the engine is controlled by a centrifugal governor which regulates the opening of the gas inlet valve. The cylinder is fitted with a low-tension magneto and sparking plug. The timing of the spark can be advanced or retarded at will while the engine is running, and the plugs can be taken out without disturbing the ignition gear. Ring lubrication is fitted to the crankshaft bearings and feed pump lubrication is supplied to the cylinder, piston, and crank pin, the oil being fed to the various points through copper tubes. Glass sight-feeds are fitted to each delivery of the pump, so that the oil is under observation and can be easily regulated. The arrangements are such that different grades of oil can be used for the crank pin and the cylinder.

Each engine is provided with ten water tanks, situated on the roof of the building, each tank measuring 32 in. diameter by 5 ft. 4 in. effective depth, giving a total quantity of about 1,870 gallons of cooling water for each engine.

The direct current generators are of the Electric Construction Company's compound wound interpole open type, and have each an output of 54 kW at 220 volts on constant load. The switchboard consists of two black enamelled slate slab panels, 1½ in. thick, each fitted with an overload and reverse current air-break circuit breaker, 8-in. dial moving coil ammeter and similar size voltmeter, voltage regulator and fuses, and a double-pole quick-break knife switch, one pole of this switch being used as an equalizing switch. The feeder panel is arranged to provide separate circuits to the various points in the Works.

The generating sets have now been in use thirteen years and have given entire satisfaction. The engines are particularly easy to start and have proved their reliability and durability. Maintenance costs are very low, the largest item of expenditure being in the renewal, last year, of the cylinder liner and piston of each engine, after a working period of approximately 44,000 hours. The connecting rod bolts are renewed after each 10,000 working hours period, which conforms with the recommendations of the insurance companies.

The dynamos require very little attention beyond the usual inspection; no repairs or renewals have been necessary, and even the carbon brushes in use to-day are the originals supplied with the machines.

Bearing in mind the rather frequent failures of late in the bulk supply of electricity, this type of self-contained generating set should be of especial interest to those users of electrical energy who have been compelled, by reason of such failures, to consider installing their own plant to ensure reliable and economical production of electricity.

Water Gas Plants.

Two Humphreys & Glasgow carburetted water-gas plants are installed at these Works, one being capable of producing 650,000 cu.ft. of carburetted water gas per 24 hours; the other plant having a nominal capacity of 1,250,000 cu.ft. per 24 hours.

The plants were installed in the years 1907 and 1921 respectively, and are now only used when necessary for balancing coke stocks. Although they are not equipped with any of the later improvements, they are easily manipulated and capable of efficient and economical working.

Average test results obtained on the larger plant were as follows:

Gas made	1,363,000 cu.ft. (corrected)
Calorific value	456 B.Th.U.
Oil used per 1,000 cu.ft.	1·54 gallons
Inerts in gas	8·37 %
Coke used per 1,000 cu.ft. including ash and moisture	37·6 lb.

When this plant was installed, an additional blower plant was provided, of sufficient capacity to supply both water-gas plants. The fan is direct-coupled to a non-condensing De-Laval steam turbine of 55 b.h.p. when running at 1,500 r.p.m. with a steam pressure of 100 lb. per sq.in. The two smaller blowers which served No. 1 plant can be worked together as a standby to the larger blower. No. 2 water gas plant is equipped with oil, air, and steam meters, oil and steam pressure dial gauges, and also a Cambridge electrical pyrometer for indicating the temperature of the superheater.

As a check on the working of the plant, an automatic chart is provided which records the duration of the "runs" and "blows" and the time taken in coking and cleaning the generator.

Coke storage is provided on a reinforced concrete platform erected in front of the building on the same level as the operating floor, the full capacity of the platform being 38 tons, which is sufficient for supplying both water gas plants over a period of 24 hours. The coke is elevated in a skip by means of an electrically-driven hoisting and travelling block, the skip being filled at the coke hoppers and conveyed to the hoist by a specially constructed horse-drawn cart.

The oil used is supplied by the Shell-Mex and B.P. Company, and is received in railway tanks on the elevated siding, being run off by gravity to the storage tank situated near the carburetted water-gas plants. The oil storage tank is embodied in the water gas relief holder, this method of construction being necessitated by reason of the restricted ground space. The combined relief holder and oil tank was erected in the year 1907, the tank being 38 ft. outside diameter by 25 ft. deep.

The gasholder is of single lift column guided type, 36 ft. 7 in. diameter by 22 ft. deep, and has a gas capacity of 22,500 cu.ft. The oil storage tank is 34 ft. diameter and is constructed inside the relief holder tank so as to form an annular ring to contain the water seal necessary for the working of the relief holder bell. The bottom of the annular ring is 3 ft. above the bottom of the tank and is supported on eighteen cast-iron columns, each 6 in. diameter, these latter being provided with suitable caps and bases, and bolted to the bottom of the annular water seal ring.

The roof framework over the oil tank forms a support for the crown of the holder when the latter is grounded.

A hollow cast-iron centre post, 10 in. outside diameter, with ¾ in. thick metal, supports the roof framework, the bottom of the post being provided with a square flange and bolted to two 5 in. by 3 in. by 11 lb. rolled steel joists, each 8 ft. long, riveted to the tank bottom plates.

The roof framework is covered with light steel sheeting to prevent water formed by condensation entering the oil tank, as we have found by experience that oil containing water, when passed through the circulating pumps and relief valve, quickly emulsifies, and when returned to the storage tank settles as sludge. The gas inlet and outlet pipes pass through the oil tank, the top of each pipe being flanged and bolted to the steel sheet cover of the tank.

The carburetted water gas is drawn from the relief holder and passed through a P. & A. tar extractor placed before the purifiers. After purification, the gas is measured by means of a Thorpe rotary meter of 8,000 to 80,000 cu.ft. per hour capacity.

To ensure accuracy of the rotary meter we find it necessary to open it out periodically and clean the inner surfaces of the nozzles, as any deposit on the tubes has the effect of increasing the velocity of the gas impinging on the rotating vane, and results in the meter registering more gas than is made.

Condensers.

The coal gas condensers consist of a series battery of three Clapham's "Eclipse" water tube towers. As originally installed the condensers had open tops; but with the object of pre-heating the water used on the boilers, the tops were covered with steel plates securely bolted to the flanges of the condensers and the town water used in cooling the gas is now passed to an overhead storage tank situated a few feet above the level of the top of the con-

densers. A relief pipe is provided on the water inlet pipe to the condensers in case of any stoppage in the condenser tubes raising the pressure unduly.

The steam-raising plant consists of a battery of four Lancashire boilers, all fitted with Meldrums forced draught; Nos. 1, 2, and 3 are each 8 ft. diameter by 30 ft. long; No. 4 being 7 ft. 6 in. diameter by 28 ft. long. An old retort house chimney is utilized for all the boilers. Breeze fuel only is used, the breeze being delivered to the front of the boiler-house by means of the high-level telpher.

The exhausters are contained in a machinery room embodied in a range of buildings comprising the water-gas generating house, machinery room with stores above, and boiler house. The assembling in one room of the exhausters with the carburetted water gas turbo blowers and pumps enables one attendant to control the whole of the machinery.

There are four sets of rotary exhausters, all direct driven by horizontal steam engines; Nos. 1 and 2 are used for coal-gas, No. 4 for carburetted water-gas, and No. 3 is so connected that it can be used on either coal gas or carburetted water gas.

All the exhausters are of the four blade type and have each a capacity of approximately 80,000 cu.ft. per hour at 70 r.p.m. against a pressure of 40 in. water column.

The washing and scrubbing plant comprises a 2 million cu.ft. per day Livesey washer; a tower scrubber filled with thin boards on edge and having a tar extractor on the Livesey principle fitted in the base, and a steam engine driven Holmes rotary scrubber of the brush type.

Purifiers.

There are eleven purifiers in all, these being arranged in three groups; one group of four being used for coal gas, another group of four for carburetted gas, the remaining group of three being used as catch boxes for both coal gas and carburetted water gas.

The sizes of the purifiers are as follows:

Coal gas purifiers, 35 ft. by 25 ft. by 5 ft. 8½ in. deep.

C.W. gas purifiers, 30 ft. by 20 ft. by 6 ft. deep.

Catch purifiers, 40 ft. 10½ in. by 16 ft. 6 in. by 6 ft. 6 in. deep.

The carburetted water gas purifiers and catch boxes are fitted with Sadler Cockey reversing centre valves, the coal gas boxes being fitted with a 24 in. Cockey non-reversing centre valve, up-flow only of the gas being possible in these boxes. The C.W.G. purifiers are so connected that they can be used on coal gas when the water gas plant is not being used.

All the purifiers are elevated on steel columns and girders, this arrangement enabling the floor space underneath the purifiers to be used for revivification of the oxide. Further revivification space is provided by the erection of a reinforced concrete floor on a level with the top of the purifiers. The purifying material is lifted by an electrically-driven bucket elevator and deposited on a rubber band conveyor which is provided with a travelling throw-off carriage for distributing the oxide through canvas chutes into the purifiers.

All the purifiers are provided with bottom doors for emptying, the material being dropped to the revivifying floor below, where, to avoid spontaneous combustion, it is broken up as quickly as possible by means of an electrically driven Crone & Taylor disintegrator of 12 to 20 tons per hour capacity.

The coal gas purifiers, which were erected in the year 1902, were each fitted with four covers provided with rapid opening fasteners, the fasteners being attached to square bars running the full length of each side of the opening. The covers were secured by operating the fasteners simultaneously by turning the bars at the ends. Owing to the trough shape of the covers, they were difficult to keep clean and were always more or less full of water, consequently, when it became necessary to renew them about two years ago because of their corroded state, the opportunity was taken to re-design the whole arrangement.

In the new design the existing cast-iron double web brackets through which the square bars passed were utilized for the fasteners. These brackets are spaced about 2 ft. 11 in. centres around the openings, the 3 in. diameter holes in the brackets were fitted with turned cast-iron bushes, each with a 1-in. diameter clearance hole through the centre to take the hinge pin of the holding-down bolt. The steel holding-down bolts are 1 in. diameter, and each is provided with a screw handle fastener and a ¼ in. thick washer. Each new cover measures 13 ft. 5½ in. long by 8 ft. 11¾ in. wide overall, and has a camber of 2 in. at the centre.

The curb is formed of 6 in. by 4 in. by ⅝ in. steel angles with eighteen notches 1½ in. wide by 2¼ in. deep, suitably spaced to receive the holding-down bolts. The steel sheeting is ⅜ in. thick, lap-jointed in three sections by means of ½ in. diameter rivets spaced 1½ in. pitch, and riveted to the curb angle with ⅝ in. diameter rivets. The cambered sheet plates are stiffened by two 4 in. by 3 in. by ½ in. steel tee bars, each stiffener being riveted to the sheeting by means of ⅝ in. diameter rivets spaced 6 in. staggered pitch.

Four lifting shackles are provided for each cover, these being attached to the steel tee stiffeners. Each cover is provided with a 6 in. diameter tapered cast-iron air plug, the flanged socket being secured to the sheeting and stiffened on the underneath side by means of a ⅝ in. thick mild steel ring.

Rubber jointing material is used for the covers, the rubber being in the form of flat strips, 2 in. wide by ¾ in. thick laid on the faced surfaces along each side of the purifier openings, each end of the strips being stepped to form the joint at each corner. To prevent sticking of the jointing material when the covers are lifted, the faced surfaces and the rubber strips are covered with plumbago applied with a brush. This type of joint has proved most satisfactory, being quickly made and perfectly gas-tight when under pressure. Furthermore, it has the added advantage of being cheap and easily renewed when necessary.

The gas boosting plant was installed in the year 1920 to maintain the district pressure when the gasholders uncupped, and also to boost gas from the Shields Works to the gasholders at the Company's Jarrow Works, which are situated a distance of about 3½ miles away.

The plant consists of a 900 mm. single-stage Rateau type fan capable of passing 500,000 cu.ft. of gas per hour at a differential pressure of 20 in. W.G. The fan is driven by a De-Laval non-condensing steam turbine of 40 b.h.p. running at 2,500 r.p.m. with steam pressure at 80 lb. per sq.in.

Similar plant is installed at the Jarrow Gas-Works, the gas connections at both Works being so arranged that it is possible to pass gas from the holders at either Works to the holders of the other while boosting of the district pressure is also taking place. The ordinary distribution mains are connected at two points to the boosting main between South Shields and Jarrow, the pressure being regulated by means of Peebles district governors.

The gas storage capacity consists of four column-guided gasholders in brick tanks, two of the holders being situated at the Shields Works and two at Jarrow Works, as follows:

—	No. of Lifts.	Capacity, Cu.Ft.
Shields Works, No. 1 . .	2	1,400,000
,, ,, , No. 2 . .	3 (including flying lift)	287,610
Jarrow Works, No. 1 . .	2	310,000
,, ,, , No. 2 . .	2	310,000

Periodic routine examination of the holders is made in accordance with the recommendations embodied in the First Report of The Institution of Gas Engineers Gasholder Sub-Committee, 1932. Separate records are kept for each holder, showing the date and result of the inspection and particulars of any repair work carried out.

In conclusion, I take this opportunity to thank the Chairman and Directors of the South Shields Gas Company and my chief, Mr. Dugald Currie, for their kindness in permitting me to address this meeting, and also for the ready invitation extended to the members of this Section of the North of England Gas Managers' Association to visit the Gas-Works and Distribution Department as their guests.

Vote of Thanks.

Mr. F. NICHOLLS (Gateshead) moving a vote of thanks to the Chairman for his Address, said he thought the Paper descriptive of the works and the visit to the works later, made an ideal combination.

Mr. J. W. PALLISTER (Middlesbrough) seconded, and the vote of thanks was heartily accorded.

Mr. F. P. FALL (Sunderland) proposed a vote of thanks to the Chairman, Directors, and officials of the South Shields Gas Company for their hospitality to the Section during its visit to South Shields. Mr. C. S. READ seconded and the vote was carried with enthusiasm.

At the conclusion of the meeting the members visited the distribution department of the Company's works and were later entertained at tea by the Chairman and Directors of the Company.

Parkinson & Cowan, Ltd.

Thirty-Sixth Ordinary General Meeting

The Thirty-Sixth Ordinary General Meeting of Parkinson & Cowan, Ltd., was held on Tuesday, June 16, at Terminal House, S.W. 1.

Lt.-Col. HAROLD W. WOODALL, C.I.E., M.Inst.C.E. (Chairman and Managing Director), presiding, said: The year has been a difficult one in many ways. Sales have been of a promising nature, but the production of the special appliances to which I alluded last year has been seriously hampered.

The revival in the engineering and heavy industries came just at a time when we were developing new products, putting up new workshops, and ordering new machinery to enable us to cope with expanding business. In every case we were handicapped by a shortage of labour, and buildings and machinery were many months behind promised delivery dates.

In addition to this we were faced with all the difficulties and expenses attendant on the launching of new products. I am glad to say that we are now in full production, that difficulties have been overcome, and that from now onwards, unless anything unforeseen occurs, profits will be in accordance with original anticipations.

In these circumstances, the improved results indicated in the report afford ground for encouragement, and it is satisfactory to note that the improvement is spread over almost every section of our widespread interests, though some of our overseas interests have caused us anxiety.

The development of our business continues on sound lines. Additional workshops have been added to the premises of one of our main subsidiaries during the past year, and we have expended a considerable sum of money on the installation of new plant for the purpose of securing more economical production. Research work in developing new types of gas appliances calculated to assist gas undertakings to obtain increased output has been energetically pursued. Among other things produced is a form of foot-operated igniter which enables gas fires to be turned on and off by means of a foot-pedal, and it is believed that this will materially assist gas undertakings to increase the sale of gas.

Two things are causing us some anxiety—one is the cost of materials and the other labour. Ever since the slump set in we have been told that prosperity could not come until the price of primary commodities went up, but very little has been said as to who was to foot the bill. In the initial stages of advance there may be some doubt as to the answer, but there can be no doubt that in the end it must be the consumer who pays.

In our particular industry the price of practically every commodity we use has advanced during the past three years. Even the price of the leather we use for our meter diaphragms has risen by more than 50% since 1933, and the recent advance in the price of coal will add to the cost of practically everything that we make and everything we buy. In addition, it will seriously affect the Gas Industry, who purchase our goods, and the consumers who use them.

The Coal Position.

How serious a matter this is seems to be little recognized. We all recognize the importance of the coal industry, and it is generally admitted that concerted measures to place it in a sound financial and economic position are overdue.

On the other hand, it is on cheap coal that the prosperity of this country has been built up, and if the Government were to look round for the best means of penalizing the entire population—rich and poor alike—not only in one way but in several, they could not choose a more certain instrument than a tax on coal.

This is not the place to go into the reason why the coal-mining industry has arrived at its present position, but anyone interested in the welfare of the country must view with grave alarm proposals that—in entire variance with previous practice in the case of monopolies or partial monopolies—afford the coal-owners practically uncontrolled monopolistic powers and fail to secure to consumers, or to any class of consumer, protection against unfair charges, insufficient supplies, or unsuitable qualities of coal. Such proposals constitute precedent fraught with grave danger to the country.

Everyone will welcome measures to improve the efficiency of production or to secure economies in the distribution and sale of coal. Such reforms would be of material benefit to the miner and coalowner, but it is essential that reasonable provision shall be made to protect the interests of the public.

Unfortunately the committees of investigation on which the Government rely to safeguard the interests of the consumers are valueless and impracticable. It is hoped that shareholders will call the attention of their members of Parliament to this aspect of the Bill and ask them to oppose the Draft Coal Orders now lying on the tables of the Houses of Parliament so that such Orders may not pass into law until such time as fresh legislation has been passed which will give to the consumer the fair and adequate protection which he is denied if the coal monopoly now being established remains unaltered.

In the present disturbed position of political and economic affairs throughout the world it is rash to prophesy anything, but the position of the Company is more promising than it has been for some years past and, given stable conditions at home and abroad, should improve during the course of the present year.

The report and accounts were unanimously adopted, after which the appointment of Mr. Daniel M. Henshaw as a Director was confirmed and the retiring Directors, Sir William S. Haldane, W.S., and Mr. Eric W. L. Cowan, were re-elected.

The Auditors, Messrs. Cash, Stone, & Co., were re-appointed, and the proceedings terminated with a vote of thanks to the Chairman, Directors, and Staff.

Whessoe Foundry and Engineering Company, Ltd.

Further Increase in Output

The Sixteenth Annual Meeting of the Whessoe Foundry and Engineering Company, Ltd., was held at 25, Victoria Street, London, S.W. Mr. HAROLD G. JUDD, C.B.E., C.A. (Chairman of the Company), presided.

The SECRETARY (Mr. W. T. Pallin) having read the notice convening the meeting and the report of the Auditors,

The CHAIRMAN said: Since the close of the year your Directors elected to the Board Mr. Richard Airey, who has had a long experience in the industries with which Whessoe is closely connected, and we welcome him here to-day. I am sure he will prove a valuable member of the Board and later on you will be asked to confirm his election.

Last summer Mr. Hodgson, who has for many years managed the Company's business with such conspicuous ability, informed us of his desire to be relieved of the burden of executive work, and in September he resigned his position as Managing Director. I am glad to say that he has agreed to remain as a member of the Board. Mr. Spielman was appointed Managing Director in his place, and we have already had evidence of the wisdom of this choice.

The Directors are glad to be able to present accounts which reflect an improvement in the business of the Company.

The output for the year reached the highest figure since 1930, and although competition has continued to be keen, Whessoe has been able to secure a fair share of the work that was going. While much of our work has been in the production of tankage and oil refinery plant, I am glad to say that further progress has been made in widening the basis of our products; a growing amount of work has been secured for blast furnace and other gas-cleaning plant, including electrical precipitation plant.

Despite foreign competition we have been able to secure a fair amount of work abroad; the outlook for such orders is, however, somewhat clouded now by the action of the British steel-makers in raising their prices to customers in this country while retaining a lower scale of prices to our competitors abroad. This anomaly which adversely affects the engineering industry in this country ought to be removed, and we hope that the steel-makers will take steps soon to rectify it.

The works and plant have been maintained in first-class condition, and where necessary additional machines have been installed to cope with the demands of certain new products on which we are engaged. Special attention has been directed to the pickling of plates by a phosphoric process which has been evolved for the protection of oil tanks against corrosion. We believe that Whessoe is in the forefront in this matter, which represents what is perhaps the greatest advance made in anti-corrosion in recent years. In order to cope more efficiently with the resulting demand for pickling, a new shop has been erected.

Another special feature is the greatly increased application of electric arc welding to our various products. During a visit to U.S.A. last summer Mr. Spielman made careful investigation into the most recent methods there, and this, supplemented by research and enquiry on this side, has enabled us to undertake intricate welding work by the most economical and up-to-date methods.

In passing I should like to say that a good deal of credit is due to Mr. Spielman and our technical staff for the work they have carried out on these two processes particularly.

Turning to the accounts, the improvement in the trading profit is in large measure due to the considerable increase in production to which I have alluded. This increase accounts also for the larger sums appearing in the balance-sheet for work in progress, debts due to the Company and sundry creditors. Certain of our investments were realized during the year to finance the larger production, and we were again fortunate in securing a satisfactory profit on these realizations. In that connection I may mention that the present value of the remaining investments, which stand in the balance-sheet at £51,473, is well in excess of the book figure, and the investment in our subsidiary company is more than represented by liquid assets.

Out of the profits of the year we have made provision for the income-tax payable in future in respect of the profits of the year under review. After making this provision and full allow-

ance for depreciation and special expenditure, there is a net profit for the year of £17,529, which, added to the carry-forward of £3,782, makes a total available of £21,321. You may remember that in 1933 we took £5,000 out of general reserve for equalization of dividends; your Directors feel that it would be prudent to restore that sum now that we have had a satisfactory year, and they have accordingly transferred £5,000 to general reserve, bringing it up to the previous figure of £40,000. We recommend the payment of a dividend of 7½% (less tax), requiring £11,437 10s., leaving to be carried forward £4,883 16s. 2d.

To sum up the position I may say that the works and plant, which have been extensively modernized and improved in recent years, stand at practically the same figure as when the Company was formed 16 years ago. The loose plant, stocks, and work in progress are all conservatively valued, and the financial position is strong. The current year has opened with a fairly satisfactory order book, and despite keen competition the Company is favourably placed to maintain the position it has secured.

In conclusion I must pay tribute to the loyal and efficient service rendered by the Management and the staff. I need hardly say how much we and they regret that Mr. Hodgson found it necessary to lay down the burden of a Managing Director's duties. Our best wishes follow him in his semi-retirement.

I have pleasure in moving the adoption of the Directors' report and the accounts and the declaration of the dividend recommended therein.

The resolution was carried unanimously and the retiring Director and the Auditors were re-elected.

A vote of thanks to the Chairman concluded the proceedings.

Deal and Walmer Gas (Charges) Order, 1921

Application by the Deal Corporation for Revision of Standard Price

Mr. J. F. Ronca, Director of Gas Administration, held an enquiry at Montagu House, Whitehall, London, on June 17, into an application by the Deal Corporation for an Order under Section 1. of the Gas Regulation Act, 1920, revising the powers of charging authorized by the Deal and Walmer Gas (Charges) Order, 1921. Mr. Maurice Fitzgerald appeared for the Deal Corporation, and Mr. H. Royston Askew for the Deal and Walmer Gas Company.

Mr. FITZGERALD, opening the proceedings, said that costs and charges had altered substantially since 1921 and accordingly it was submitted that an amending Order ought to be made. The Company claimed that it was not proper that such an amending Order should be made because there had been no substantial alteration, and the case the Tribunal had to deal with depended on the evidence put before it. He would put before them the evidence on which the Corporation relied as justifying the alteration which was asked.

Mr. *Arthur Valon*, Consulting Engineer, explained in detail a number of tables on which the claim was based that a fair and new standard price should be 11·6d. per therm.

In reply to Mr. Askew, witness said it was incorrect to say that he had ignored any question in regard to the efficiency of buying and selling. He had taken the proper factor of increase on 1914. It was not right to say that in arriving at the price of 11·6d. he had only built part of the structure which the Act required should be built, but had given everything.

Mr. ASKEW asked the witness if he were aware that the rates payable by the Company had risen substantially since 1935.

Witness said he was not aware of that. Before the war the rates were 7s. 4d. in the £ and they were now 11s. 11d., which were the figures he had taken as showing an increase of 63%.

Mr. ASKEW pointed out that the Deal Corporation had proposals before them for large works to be carried out which must necessarily increase the rates payable in Deal if the schemes matured. There was, for example, a great modern drainage scheme.

Witness said the calculation must be on the basis of an increase that had taken place, and not an increase that might occur in future.

Mr. ASKEW submitted that the witness in his calculation had made no allowance for the fact of an increased efficiency by the Company in supplying fittings and apparatus to their consumers.

Witness replied that he had.

Mr. ASKEW asked whether if there had been an increased cost to the Company with regard to public lamps in order to retain the sale of gas, that increase ought to be brought into consideration?

Witness: I am not sure. If they spend money to get increased business they must take the rough with the smooth.

Mr. *George Evetts*, Consulting Engineer, presented a number of tables relating to the Company's costs and charges.

Witness was asked by Mr. Askew about the question of public lighting. That expenditure, said Mr. Askew, had not been included in Mr. Valon's Table, but where in modern times, and under modern conditions, a Company had to meet a higher cost in maintaining the lamps, that was an item, he suggested, that should be brought in.

Witness said he considered the increased maintenance charges a fair claim.

Cost of Coal.

With regard to the cost of coal, witness stated, in reply to Mr. Askew, that the Deal Company was paying the 1s. extra which was agreed on by gas undertakings in respect of present contracts from Jan. 1, 1936. All enquiries which they had put out for further coal showed an increase of an additional 1s. 6d.–2s. 6d. in all—as compared with 1935. The only new contracts made in which he had been personally interested showed an increase of 2s. Therefore he had no hesitation in putting in a 2s. increase ruling at June, 1936.

Mr. ASKEW: A striking fact emerges from the figures, that while the cost of making a therm of gas by the Company in 1913 was 6·53d. per therm, that has only risen at the present time to 6·87d.

Witness: Yes, and a year ago the figure was actually reduced.

Mr. ASKEW: Does that indicate that there must have been an extraordinary increase in the efficiency with which the undertaking is carried on?—Yes.

Witness said that in the last two years the Company had under the ægis of the South-Eastern Gas Corporation been able to buy all its general stores cheaper than it would have been able to buy them otherwise.

Mr. FITZGERALD questioned the witness with regard to the amount which was given for repairs and renewals when the Company were before the Board of Trade in 1921, with a view to showing that if the right figure was given them—namely, 3·30d.—there must have been a substantial drop since then in the costs.

Witness pointed out that the Company had had to spend in order to obtain advantage of the increased efficiency they had shown.

Mr. ASKEW, addressing the Tribunal, submitted that the basis that Mr. Valon had adopted was not the right basis, and therefore could not produce the right result. Mr. Evetts' table showed a standard price of something over 14d. per therm, as against Mr. Valon's figure of 11·6d. No account had been taken in Mr. Valon's table of the full rise in the price of coal, and then for the rest all the various considerations relating to the effect of increased efficiency were, as he submitted, ignored. If the Board of Trade were satisfied that the method adopted by Mr. Evetts was a right and proper method, then it was clear it must produce the result it had produced. On behalf of the Company he suggested that the figure of 14·03d. or in round figures 14d., was a proper figure for the Board of Trade to fix, and that any lower figure would be unjust to the Undertaking.

Mr. FITZGERALD, in his address, said one of the factors with which they had to deal was the variation that had occurred in the costs between 1921 and the present day. The suggestion had been made that there should be a reduction of only 1d., but Mr. Evetts had stated that he knew of only one case in which there was anything approaching to that small reduction, and that was by agreement. If Mr. Evetts' figures were right, the result would be that the Company would be able to pay 2¾% above the standard dividend, which would work out on the pre-war basis that they would be selling gas at 1s. 5d. per 1,000 cu.ft. Mr. Evetts admitted that in no circumstances could he anticipate that the Company could sell gas at that figure. That was fundamental to the whole matter. It was on the question of improved efficiency that the difference arose between the two sets of prices which had been put forward. Mr. Evetts had in substance admitted that in calculating the improved efficiency he had taken credit for the savings and had not made any debit for the cost of getting that efficiency. Counsel maintained that the new standard price ought to be 11·6d.

The enquiry then closed.

General Gas and Electricity Company, Ltd.

Annual General Meeting.

The Annual General Meeting of the General Gas and Electricity Company, Ltd., was held at 50, Cannon Street, E.C. 4, the Registered Offices of the Company, on the 18th inst.

Mr. W. A. Scott (the Chairman) said: The year's accounts have come out satisfactorily, the result being progress all round. The net profits of the Company for the year ended March, 1934, were £5,950 17s. 2d.; March, 1935, were £6,829 15s. 5d.; and this year £9,260 0s. 11d. The dividend paid in respect of 1934 was 5%, in respect of 1935 4%, and this year it is proposed to pay 5%. During these three years we have been able to write off and clear the balance-sheet of the preliminary expenses and other unproductive assets amounting to £5,702.

Since the last annual meeting two gas-works have been taken over—namely, Amlwch in the Isle of Anglesey and Kington in Herefordshire. Amlwch which was not taken over in the first instance, although the Company were under contract to do so, has progressed so far that the Company bought all the shares and took complete control, the profits being sufficient to pay to the General Gas and Electricity Company dividends in respect of the Preference Shares and the Ordinary Shares.

Since March, 1936, the Company have acquired the works at Llandovery thereby completing a group of six works in that district.

The policy of the Directors is not to endeavour to obtain control of the large companies, which are already well managed and directed and where there is not much scope for improvement, but to confine themselves to the smaller works, which although small have prospects of a greater output and prosperity, works that have been stultified and held back for want of capital and enterprise on the part of the Directors, who in most cases have no knowledge of the management of gas-works. The Company having the necessary capital has been able to improve the works and make them more economical in manufacture and management, and to provide necessary extensions which in the past have been allowed to lie dormant.

You will notice that at the foot of the balance-sheet it is stated that three of the subsidiary companies have made a loss. These losses, however, are not losses in operating the works, for the three have in fact made a working profit of £818. What is called loss is interest charged on loans employed for extensions, which had not so far yielded sufficient return to cover the interest payable. In several cases Estates are being developed and building operations are proceeding, and it is not until these houses are complete and occupied that the Company can reasonably expect to obtain a profitable return, but will in future years prove a great benefit to the Company.

If we were not first in the field with gas, the introduction of electricity would practically retard to some extent the progress of the gas undertaking. On the other hand, gas being first in the field, the occupiers of the new houses will equip themselves with gas cookers, gas heaters, water heaters, and other gas appliances, which no amount of canvassing on the part of the Electricity Companies coming in afterwards will be able to disturb to any great extent.

The net profit from the works operated by the Company were in 1934, £729, 1935, £629, and this year £1,031, whilst the total income of the Company has increased from £7,759 in 1934 to £9,356 in 1935 and £12,411 in 1936. The quantity of gas sold by the subsidiary companies and those works operated by the Company themselves amount to: 1933, 96.162,800 cu.ft.; 1934, 132,321,400 cu.ft.; and 1935, 145,049,800 cu.ft.

An issue of preference shares was made during the year by which premiums amounting to £426 5s. were received. It will be noted that of the £200,000 authorized capital, £142,637 has been issued, leaving a balance of £57,363, which it is the intention of the Directors to issue in the near future.

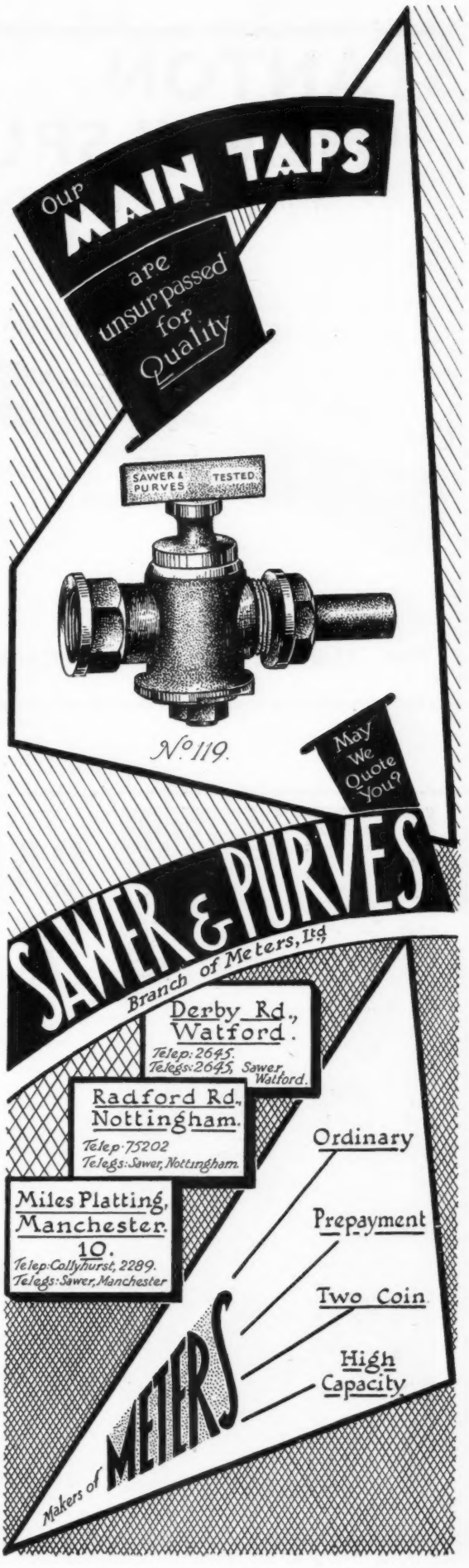
I am pleased to say that Mr. J. W. Kaye, a Member of The Institution of Gas Engineers, who is the Chief Engineer to the Ascot and District Gas and Electricity Company, has accepted a position as Director, and as the report states he will be proposed for re-election. Mr. Kaye is a gentleman of wide experience in gas engineering, with undoubted engineering qualifications, and with him on the Board, together with Colonel Bridges, who is a gentleman of high repute as an Electrical, Water, and General Consulting Engineer, I may say that the shareholders may have full confidence that the Company is under the most efficient management, technical as well as general.

The Chairman concluded by moving the adoption of the Report and Accounts. Colonel Walter Bridges seconded the Resolution, which was carried unanimously.

The Chairman proposed and Mr. J. W. Kaye seconded the Resolution that the payment of Preference dividends be confirmed and that a dividend of 5%, less income-tax, be paid on the Ordinary Shares for the year ended March 31, 1936, the Resolution being duly carried.

Lt.-Colonel W. Bridges and Mr. A. E. Scott, the retiring Directors, were re-elected, the appointment of Mr. J. W. Kaye as a Director of the Company was confirmed and he was duly re-elected a Director of the Company, and the Auditors, Messrs. W. Wesson & Co., were re-appointed for the ensuing year.

The Meeting terminated with a vote of thanks to the Chairman, Directors, and the Staff.



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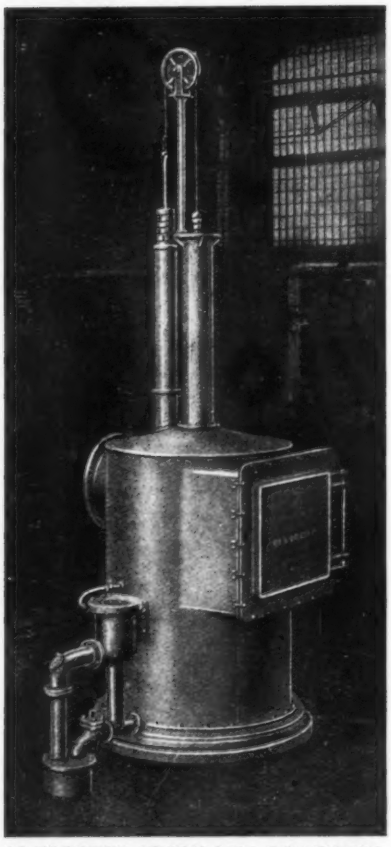
Manufactured under Delavaud and Mairy Patents

No Chill
No Annealing
No Hard Spots

The Stanton Ironworks Company Limited, Near Nottingham



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GAS WORKS PLANT
OF
ALL DESCRIPTIONS
INCLUDING
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TAR EXTRACTORS.

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Gas Markets and Manufactures

Stock Market Report

(For Stock and Share Lists, see later pages)

Despite the continued uncertainty of the French situation, the Stock Exchange fortnightly account closed last week with a confident tone prevailing in most sections. British Funds were again in good demand and received a further fillip by the Government's decision to raise sanctions, prices closing fractionally higher than a week ago. With the many excellent reports still coming in—that of John Brown & Co. being a noteworthy example last week—good business was also done in home industrials, particularly steel shares, and a large number of issues improved in value. The only really weak spot was the Home Rail Market which remained under the cloud of the wages question, and in the absence of support prices continued to fall.

Business in the Gas Market, though well up to the average, was not so heavy as the previous week. Nevertheless a number of transactions were recorded at higher prices, but the increases, except in a few instances, were not sufficient to justify any change in the quotations. On the London Exchange, Alliance and Dublin ordinary, to which reference was made last week, was the chief feature with a rise of 5 points to 160, and gains of 1 point each were made by Imperial Continental, Tottenham, and Wandsworth ordinaries, the 5% debenture stock of the latter Company rising 2 to 125½. Business in the Supplementary List was comparatively quiet, the only change being a slight set-back in Gas Consolidation preference, while at the Provincial Exchanges movements occurred in Bristol ordinary stock and Newcastle units, both registering small gains.

The second report and accounts of Gas Consolidation, Ltd. (a holding company registered in 1934), cover the full year to May 31 and show a revenue balance, after providing for all expenses including taxation, of £18,120. The Directors are proposing to distribute a final dividend of 3% on the ordinary shares, making 5% for the year (against 4% per annum for the first accounting period), which will leave £1,748 to be carried forward against £909 brought in. Investments, at cost, stand at £436,505, of which £323,100 is represented by holdings in subsidiary undertakings. The ordinary shares are quoted at round about 21s. 3d., the yield on a 5% basis working out at £4 14s.%

Current Sales of Gas Products

The London Market for Tar Products.

LONDON, *June 22.*

The prices of tar products remain steady at about the following levels:

Pitch is nominal at about 37s. 6d. per ton f.o.b.

Creosote, 5½d. per gallon.

Refined tar, 3¾d. per gallon in bulk at makers' works.

Pure toluole, about 2s. 6d.; pure benzole, 1s. 7d. to 1s. 8d.; 95/160 solvent naphtha, about 1s. 8d.; and 90/160 pyridine, about 4s. 3d. to 4s. 6d.—all per gallon naked at makers' works.

Tar Products in the Provinces.

June 22.

The average prices of gas-works products during the week were: Gas-works tar, 20s. 3d. to 25s. 3d. Pitch—East Coast, 35s. to 37s. 6d. f.o.b. West Coast—Manchester, Liverpool, Clyde, 35s. to 37s. 6d.* Toluole, naked, North, 2s. 2d. to 2s. 4d. Coal-tar crude naphtha, in bulk, North, 8d. to 8½d. Solvent naphtha, naked, North, 1s. 4d. to 1s. 5d. Heavy naphtha, North, 1s. 1½d. to 1s. 2½d. Creosote, *ex* works, in bulk, North, liquid and salty, 4⅝d. to 4⅞d.; low gravity, 4⅝d. to 4⅝d. Heavy oils, in bulk, North, 5d. to 5¼d. Carbolic acid 60's, 2s. 4d. to 2s. 6d. Naphthalene, £22 to £24. Salts, 100s. to 105s., bags included. Anthracene "A" quality, 3d. to 3½d. per minimum 40%, purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *June 20.*

There is little new business being arranged in this district owing to want of prompt supplies, particularly of the finer products. Prices are well held and demand continues strong.

Crude gas-works tar.—The actual value is 34s. to 35s. per ton *ex* works in bulk.

Pitch.—This is one of the dull features with value nominal at 32s. 6d. to 35s. per ton f.o.b. Glasgow for export, and about 32s. 6d. per ton *ex* works in bulk for home trade.

Refined tar.—While throughput is disappointing there is a fairly steady demand which, it is anticipated, will increase as the season progresses. Quotations are steady at 3d. to 3½d. per gallon f.o.r. for export, and 3⅝d. to 4d. per gallon *ex* works in buyers' packages for home trade.

Creosote oil.—Although production is generally lower at this time of the year, there is sufficient to meet demand which, if anything, is not up to normal. Quotations are, however, fairly steady as follows: B.E.S.A. Specification, 5½d. to 5⅝d. per gallon; low gravity, 5¼d. to 5½d. per gallon; neutral oil, 5¼d. to 5⅜d. per gallon; all *ex* works in bulk.

Cresylic acid.—Production is well looked after and, with demand continuing strong, prices are firm. Pale, 97/99%, 2s. to 2s. 2d. per gallon; dark, 97/99%, 1s. 10d. to 2s. per gallon; pale, 99/100%, 2s. 5d. to 2s. 9d. per gallon; all *ex* works in buyers' packages.

Crude naphtha.—Supplies are a little more plentiful but readily command 5¼d. to 5⅜d. per gallon, according to quality and district.

Solvent naphtha.—90/160 grade is 1s. 5½d. to 1s. 6½d. per gallon, and 90/190 heavy naphtha is 1s. 1d. to 1s. 2d. per gallon.

Motor benzole remains rather scarce in this district at 1s. 8½d. to 1s. 4d. per gallon.

Pyridines.—90/160 grade is 5s. to 5s. 6d. per gallon, and 90/140 grade is 5s. 6d. to 6s. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s.	d.		s.	d.	
Crude benzole	0	8½	to	0	9	per gallon at works
Motor ,,	1	2	,,	1	2½	,, ,, ,,
90% ,,	1	3	,,	1	3½	,, ,, ,,
Pure ,,	1	7	,,	1	7½	,, ,, ,,

Contracts Advertised To-Day

Coal.

Haverhill Gas Department. [p. 910.]

Condensers.

Bradford Gas Department. [p. 910.]

Gasholder, &c.

Bradford Gas Department. [p. 910.]

Pipes, &c.

Clacton Gas and Water Department. [p. 910.]

Station Meter (Connersville).

Bradford Gas Department. [p. 910.]

Trade Notes

New Showrooms for J. H. Sankey & Son, Ltd.

In connection with the opening of their new showrooms at Aldwych House, W.C. 2, Messrs. J. H. Sankey & Son, Ltd., have published an interesting little illustrated booklet descriptive of the new premises.

Engineering Specialities.

Messrs. Clough (Croydon), Ltd., inform us that the factory they recently opened at Progress Way, Croydon, is completed and in production. It has been equipped with modern and exclusive plant for the manufacture of their various products. Mr. F. A. Forbes, who has had fourteen years' experience with Messrs. Thomas & Bishop, Ltd., and had recently been with Messrs. George Angus, Ltd., has accepted the position of Sales Manager with Messrs. Clough (Croydon), Ltd. He commenced his duties on June 22.

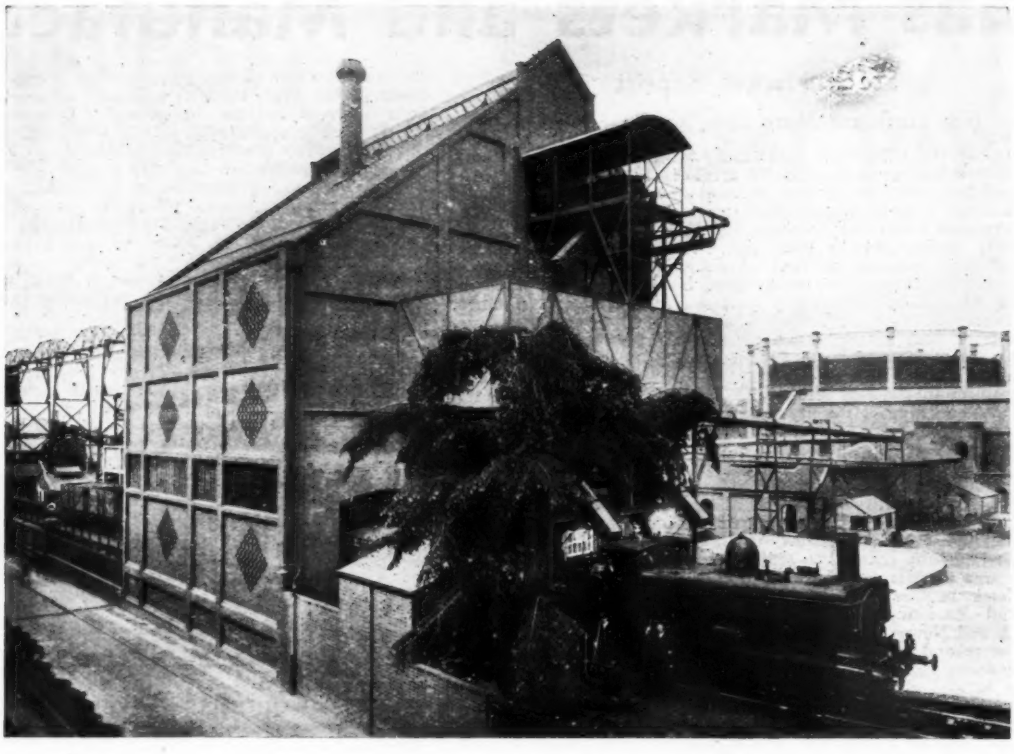
Cycle Parks.

From Constructors, Ltd., of Tyburn Road, Erdington, Birmingham, we have received a copy of their latest catalogue illustrating some of the many models of Constructors' cycle parks, which have been installed throughout the country by progressive Municipal and Education Authorities, commercial and business houses, to meet the needs of the cycling public. Owing to the enormous increase in the cycling community, the necessity for cycle parks, both public and private, is a matter of growing importance.

Sulzer Bros. (London), Ltd.

This Company announces that it has acquired as a going concern the business of Messrs. Hathorn, Davey, & Co., Ltd., Sun Foundry, Hunslet, Leeds, to enable it to manufacture in this country, with its own organization and equipment, the products on which the Sulzer reputation has been built. For this purpose a considerable sum of money is being expended on modernization of the works, and new machinery and equipment. This arrangement will not interfere with the manufacture by Messrs. Hathorn, Davey, & Co., Ltd., of their own products, as they will continue to maintain their separate connections.

REPEAT ORDER



Glover-West verticals at the works of the Worcester New Gas Light Company. An order for a second installation is now receiving attention.

The total of Glover-West vertical retort installations built or under construction throughout the world has now reached 395.

Plants are at present in course of erection in six countries.

THE WEST SYSTEMS

Glover-West Vertical Retorts • Westvertical Carbonizing Chambers • West Coal and Coke-handling Systems

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STOCK AND SHARE LIST

Official Quotations on the London Stock Exchange

Issue. £	Stock or Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations June 19.	Rise or Fall on Week.	Transactions, Lowest and Highest Prices During the Week.
1,767,439	Stk.	Mar. 16	7	7⅛	Alliance & Dublin Ord. ...	155—165	+5	...
374,000	,,	Dec. 16	4	4	Do. 4 p.c. Deb. ...	95—100	...	...
557,655	,,	Feb. 17	7	7	Barnet Ord. 7 p.c.	167—172	...	...
300,000	1	Mar. 30	1/4⅛	1/9⅛	Bombay, Ltd.	1¼—1½	...	27/4½—78/-
179,305	Stk.	Mar. 2	9½	9½	Bournemouth sliding scale ...	220—230	+2	225—227½
590,407	,,	,,	7	7	Do. 7 p.c. max. ...	170—175	...	172—172½
493,960	,,	,,	6	6	Do. 6 p.c. Pref. ...	148—153	...	...
50,000	,,	Dec. 16	3	3	Do. 3 p.c. Deb. ...	85—90	...	...
262,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	105—110	...	...
335,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	125—130	...	...
357,900	,,	Feb. 17	7½	7½	Brighton, &c., 6 p.c. Con. ...	170—175	...	...
649,955	,,	,,	6½	6½	Do. 5 p.c. Con. ...	155—160	...	...
205,500	,,	,,	6	6	Do. 6 p.c. 'B' Pref.	144—149	...	146½
855,000	,,	Mar. 2	7	8	British Ord.	158—163	...	...
100,000	,,	June 8	7	7	Do. 7 p.c. Pref.	151—156*	...	...
350,000	,,	,,	5½	5½	Do. 5½ p.c. 'B' Cum. Pref.	108—113*	...	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	95—100*	...	99—99½
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	105—110*	...	...
200,000	,,	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	97—99*	...	...
100,000	10	22 May '33	6	4	Cape Town, Ltd.	1—3	...	29/—30/-
100,000	10	6 Nov. '33	4½	4½	Do. 4½ p.c. Pref. ...	1—3	...	...
150,000	Stk.	Jan. 6	4½	4½	Do. 4½ p.c. Deb. ..	81—86	...	...
626,860	,,	Feb. 3	6	6	Cardiff Con. Ord.	130—135	...	...
237,860	,,	June 8	5	5	Do. 5 p.c. Red. Deb.	108—113*	...	110
98,936	1	Apl. 20	2/-	2 -	Colombo, Ltd., Ord.... ...	1⅜—1⅞	...	...
24,500	1	,,	1/4½	1/4½	Do. 7 p.c. Pref. ...	20/—22/-	...	...
609,204	1	Mar. 30	-/11·48	- 11·48	Colonial Gas Assn. Ltd. Ord.	18/—20/-	...	...
296,053	1	,,	1/3·30	1/3·30	Do. 8 p.c. Pref	22/—24/-	...	...
1,775,005	Stk.	Feb. 3	5	5	Commercial Ord.	95—100	...	97—98½
620,000	,,	June 8	3	3	Do. 3 p.c. Deb. ...	84—89*	...	86½
286,314	,,	Feb. 17	5	5	Do. 5 p.c. Deb. ...	120—125	...	125
807,560	,,	,,	7	7	Croydon sliding scale ...	158—163	...	162
644,590	,,	,,	5	5	Do. max. div.	115—120	...	119
620,385	,,	Dec. 16	5	5	Do. 5 p.c. Deb.... ...	121—126	...	...
239,000	,,	Feb. 3	5	5	East Hull Ord. 5 p.c....	107—110	...	...
184,555	,,	Feb. 17	6	6	East Surrey Ord. 5 p.c. ...	130—135	...	...
176,211	,,	June 8	5	5	Do. 5 p.c. Deb. ...	120—125*	...	...
19,284,128	,,	Feb. 3	5⅔	5⅔	Gas Light & Coke 4 p.c. Ord.	27/9—28/9a	...	27/10½—28/4½
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.... ...	90—93	...	90½—91
4,477,106	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	105—108	...	107—108
8,602,497	,,	May 18	3	3	Do. 3 p.c. Con. Deb. ...	87—90	...	88—89
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	115—118	...	...
3,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	113—116	...	115—116
270,466	,,	Feb. 17	6	6	Harrogate New Cons. ...	130—135	...	...
157,500	1	Mar. 16	1/7½	1/7½	Hongkong & China, Ltd. ...	1⅜—1⅞	...	...
213,200	Stk.	Mar. 2	6	6	Hornsey Con. 3½ p.c. ...	135—140	...	138½
5,600,000	,,	May 18	8	12	Imperial Continental Cap. ...	153—158	+1	154—157
223,130	,,	Jan. 20	3½	3½	Do. 3½ p.c. Red. Debs.	92—97	...	...
285,242	,,	Feb. 17	8½	8½	Lea Bridge 5 p.c. Ord. ...	175—180	...	...
165,736	,,	Mar. 16	8	10	Maidstone 5 p.c. Cap. ...	180—190	...	...
63,480	,,	Dec. 16	3	3	Do. 3 p.c. Deb. ...	80—85	...	...
75,000	,,	May 18	†10	†10	Malta & Mediterranean ... Metropolitan (of Melbourne)	195—205	...	...
392,000	—	Apl. 1	5½	5½	5½ p.c. Red. Deb.	102—107	...	...
231,978	Stk.	Feb. 17	5	5	M.S. Utility 'C' Cons. ...	110—115	...	...
818,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	102—107	...	...
360,075	,,	Dec. 16	4	4	Do. 4 p.c. Deb. ...	103—108	...	...
148,955	,,	,,	5	†5	Do. 5 p.c. Deb. ...	123—128	...	...
125,000	—	Jan. 2	3½	3½	Do. 3½ p.c. Rd. Rg. Bds.	99—102	...	...
675,000	Stk.	Nov. 18	†3	†3	Montevideo, Ltd.	70—75	...	70—71
225,000	,,	Feb. 17	7½	7½	North Middlesex 6 p.c. Con.	169—174	...	173
396,160	,,	Feb. 3	5	5	Northampton 5 p.c. max. ...	108—113	...	...
300,000	,,	Apl. 20	†9	†7	Oriental, Ltd....	165—170	...	...
416,617	,,	June 8	8	8	Plymouth & Stonehouse 5 p.c.	163—168*	...	...
504,416	,,	Feb. 3	8½	8½	Portsmouth & Gosport Cons.	170—175	...	...
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	110—115	...	...
73,350	,,	Feb. 17	...	5	Do. 5 p.c. Pref. ...	130—135	...	...
114,000	,,	Feb. 3	5	5	Preston 5 p.c. Pref.	110—115	...	...
355,698	1	Apl. 20	1/-	1/-	Severn Val. Gas Cor. Ld. Ord.	20 6—22/6	...	21/9
454,510	1	Mar. 16	-/10⅛	-/10⅛	,, ,, 4½ p.c. Cum. Pref.	21/—23/-	...	...
133,201	Stk.	Feb. 17	8½	5	Shrewsbury 5 p.c. Ord. ...	147—152	...	...
90,000	10	June 8	†3½	†4	South African...	3¾—4¾*	...	...
1,106,173	1	May 4	1/2½	1/2½	South East'n Gas Cn. Ld. Ord.	26/—28/-	...	27/—27/9
845,511	1	Mar. 16	-/10½	-/10½	Do. 4½ p.c. Red. Cum. Pref.	21/—23/-	...	22/—23/-
200,000	1	,,	4	4	Do. 4 p.c. Cum. Pref. ...	20 9—21/9	...	...
450,000	Stk.	Feb. 17	4	4	Do. 4 p.c. Red Deb. ...	101—104	...	...
6,709,895	,,	Feb. 3	5	6½	South Met. Ord.	123—126	...	123½—124½
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf....	145—150	...	...
850,000	,,	,,	4	4	Do. 4 p.c. Irred. Pf....	104—107	...	...
1,895,445	,,	Dec. 16	3	3	Do. 3 p.c. Deb. ...	88—91	...	88
1,000,000	,,	Jan. 6	5	5	Do. 5 p.c. Red. Deb.	114—117	...	...
1,543,795	,,	Feb. 3	6	6	South Suburban Ord. 5 p.c....	131—136	...	133—133½
512,825	,,	,,	5	5	Do. 5 p.c. Pref....	122—127	...	123½—124¼
500,000	,,	,,	4	4	Do. 4 p.c. Pref....	103—108	...	...
888,587	,,	June 8	5	5	Do. 5 p.c. Deb....	121—126*	...	...
250,000	,,	,,	4	4	Do. 4 p.c. Deb....	102—107*	...	...
427,859	1	May 4	9⅜	1 2⅛	S. Western Gas & Water Ord.	22 6—23/6	...	22/6—23/-
160,523	1	Apl. 20	...	-/10⅛	Do. 4½% Red. Cum. Pref.	21/9—22/9	...	...
110,000	Stk.	Dec. 16	4	4	Do. 4½% Red. Deb. ...	100—105	...	...
647,740	,,	Feb. 3	5	5	Southampt'n Ord. 5 p.c. max.	113—118	...	...
121,275	,,	June 8	4	4	Do. 4 p.c. Deb.	100—105*	...	...
350,000	,,	Feb. 3	5½	5½	Swansea 5½ p.c. Red. Pref. ...	111—116	...	115
106,000	,,	June 8	6½	6½	Do. 6½ p.c. Red. Deb. ...	98—101*	...	...
94,000	,,	,,	...	...	Do. 3½ p.c. Red. Deb. ...	95—100*	...	...
1,076,490	,,	Feb. 17	6⅔	6⅔	Tottenham and District Ord.	150—155	+1	155
409,835	,,	,,	5½	5½	Do. 5½ p.c. Pref....	130—135	...	...
62,235	,,	,,	5	5	Do. 5 p.c. Pref. ...	122—127	...	...
371,850	,,	June 8	4	4	Do. 4 p.c. Deb. ...	102—107*	...	...
369,774	,,	Feb. 3	7	7	Uxbridge, &c., 5 p.c. ...	153—158	...	...
108,330	,,	,,	5	5	Do. 5 p.c. Pref. ...	122—127	...	...
1,340,521	,,	Feb. 3	7	7	Wandsworth Consolidated ...	159—164	+1	161½—162
1,371,373	,,	,,	5	5	Do. 5 p.c. Pref. ...	122—127	...	...
500,000	,,	...	...	...	Do. 4 p.c. Pref. ...	104½—106½	...	105½—105⅝
1,317,964	,,	June 8	5	5	Do. 5 p.c. Deb. ...	123—128*	+2	125½—126⅝
338,300	,,	,,	4	4	Do. 4 p.c. Deb. ...	103—108*	...	105¾
499,735	,,	Feb. 17	6⅔	7½	Watford and St. Albans Ord.	155—160	...	157
200,000	,,	,,	5	5	Do. 5 p.c. Pref. ...	120—125	...	...
200,000	,,	,,	5½	5½	Do. 5½ p.c. Pref. ...	133—138	...	...
200,000	,,	Dec. 2	4	4	Do. 4 p.c. Red. Deb.	100—105	...	...
100,000	,,	,,	...	3½	Do. 3½ p.c. Red. Deb.	100—103	...	...
158,400	,,	Mar. 2	5	6b	Winchester W. & G. 5 p.c. Con.	122—127	...	...

a.—The quotation is per £1 of Stock. b.—Paid £3, including 10s. on account of back dividends. * Ex div.
† Paid free of income-tax. ‡ For year.

Stock and Share List continued overleaf.

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STOCK AND SHARE LIST—Cont.

Stocks Officially Quoted on Provincial Exchanges

Issue. £	Stock or Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations. June 19.	Rise or Fall on Week.	Transactions, Lowest and Highest During the Week.
BRISTOL EXCHANGE.								
347,756	Stk.	Feb. 3	5	6	Bath Cons.	124—126	...	...
1,667,250	,,	Feb. 17	5	5	Bristol, 5 p.c. max.	121—122	+ ½	...
120,420	,,	June 8	4	4	Do. 1st 4 p.c. Deb. ...	101½—103½*	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	101½—103½*	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	124—127*	...	...
274,000	,,	Feb. 17	5	5	Newport (Mon.) 5 p.c. max....	111—116	...	...
13,200	12	Mar. 16	7	8½	Pontyp'l Gas & W. 10 p.c. 'A.'	14—15	...	...
13,600	10	,,	5	6	Do. 7 p.c. B.'	11½—12½	...	...
40,000	10	,,	5	6	Do. 7 p.c. 'C.'	11½—12½	...	...
140,778	Stk.	Feb. 17	5	5	Weston-super-Mare Cons. ...	113—115	...	...
64,338	,,	Dec. 16	4	4	Do. 4 p.c. Deb.	98—100	...	...
33,340	,,	,,	7½	7½	Do. 7½ p.c. Deb.	165—169	...	...
LIVERPOOL EXCHANGE.								
157,150	Stk.	Feb 3	5	6½	Chester 5 p.c. Ord.	109—114	...	...
92,500	,,	June 8	4	4	Do. 4 p.c. Pref.	98½—103½*	...	...
32,540	,,	,,	3½	3½	Do. 3½ p.c. Deb. ...	90—95*	...	...
41,890	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	98½—103½*	...	...
2,167,410	,,	Feb. 17	6	6	Liverpool 5 p.c. Ord. ...	135—137	...	135½
245,500	,,	Dec. 16	5	5	Do. 5 p.c. Red. Pref. ...	103—108	...	...
306,083	,,	Jan. 6	4	4	Do. 4 p.c. Deb. ...	105—107	...	...
106,280	,,	Feb. 3	10	10	Preston 'A' 10 p.c. ...	202—212	...	...
189,219	,,	,,	7	7	Do. 'B' 7 p.c.	140—150	...	...
NEWCASTLE EXCHANGE.								
122,577	Stk.	Mar. 2	8	8	Blyth 5 p.c. Ord.	154—156	...	...
732,000	,,	Feb. 3	5	5	Hartlepool G. & W. Co. & New	117—119	...	...
2,061,315	,,	Feb. 3	5	5½	Newcastle & Gateshead Con.	26/3—26/9a	+-/3	...
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	107—108	...	...
776,706	,,	Dec. 16	3½	3½	Do. 3½ p.c. Deb. ...	100—101	...	...
277,285	,,	May 4	5	5	Do. 5 p.c. Deb. '43...	103—104	...	...
209,820	,,	Mar. 2	8½	8½	South Shields Con.	169—171	...	...
299,542	,,	Feb. 3	6	6	Sunderland 6 p.c. max. ...	129—131	...	...
NOTTINGHAM EXCHANGE.								
542,270	Stk.	Feb. 17	7	10	Derby Con.	176—186	...	...
55,000	,,	Dec. 16	4	4	Do. 4 p.c. Deb.	100—105	...	...
84,750	,,	Feb. 17	5	12	Long Eaton 'A' Ord. ...	175—185	...	...
50,000	,,	,,	4	10	Do. 'B' Ord. ...	130—140	...	...
20,000	10	June 8	5	5	Do. 5 p.c. Pref. ...	10—12*	...	...
80,000	Stk.	,,	5	5	Do. 5 p.c. Deb. ...	117—122*	...	...
SHEFFIELD EXCHANGE.								
10,000	Stk.	Feb. 17	10	10	Great Grimsby 'A' Ord. ...	220—230	...	...
6,500	,,	,,	10	10	Do. 'B' Ord. ...	220—230	...	...
79,000	,,	,,	10	10	Do. 'C' Ord. ...	205—215	...	...
1,806,339	,,	Feb. 17	6	6	Sheffield Cons.	146—148	...	...
95,000	,,	Dec. 16	4	4	Do. 4 p.c. Deb.... ...	100½—102½	...	...

a The quotation is per £1 of Stock.

Supplementary List of Stocks and Shares not Officially Quoted

202,152	Stk.	...	...	...	Ascot Ord.	119—124	...	...
128,182	,,	...	...	...	Do. 5 p.c. Pref.	117—122	...	...
238,631	1	June 8	5	5	Assd. Gas and Water Ord....	21/—23/-*	...	21/6—22/-
323,681	1	,,	4½	4½	Do. 4½ p.c. Cum. Pref. ...	21/—23/-*	...	...
150,000	Stk.	...	...	...	Do. 3½ p.c. Red. Deb. ...	...	...	...
17,000	,,	Feb. 17	8	8	Bognor Orig. Ord. 'A' ...	175—185	...	...
62,210	,,	,,	8	8	Do. New Addl. 'A' ...	175—185	...	...
87,160	,,	,,	7	7	Do. New 7 p.c. max. ...	145—150	...	...
37,440	,,	Feb. 3	10	10	Cam.Univ. & Town 10 p.c.max.	210—220	...	...
125,970	,,	,,	7	7	Do. 7 p.c. max.	158—163	...	...
39,025	,,	,,	5	5	Do. 5 p.c. max.	108—113	...	...
65,000	,,	Mar. 2	7½	8½	Eastbourne 'A' 5 p.c. ...	170—175	...	...
198,000	,,	,,	6	7	Do. 'B' 3½ p.c.	140—145	...	...
112,312	,,	,,	5	5	Do. 5 p.c. Pref.	120—125	...	120
130,000	,,	Dec. 16	5	5	Do. 5 p.c. Deb.	122—127	...	...
250,000	1	Nov. 18	...	4	Gas Consolidation Ord. ...	20/6—22/6	...	21/3
250,000	1	May 18	4	4	Do. 4 p.c. Red. Cum. Pref.	19/—20/-	—6	...
700,000	Stk.	...	...	...	Gas Light & Coke 3½ p.c. Rd. Db	102½—104½	...	103¼—104½
24,000	30	Feb. 3	8½	8½	Great Yarmouth 8½ p.c. max.	52—57	...	...
59,400	30	,,	7½	7½	Do. 7½ p.c. max.... ...	42—45	...	...
51,160	Stk.	June 8	5½	5½	Do. 5½ p.c. Deb.... ...	123—128*	...	...
152,600	,,	Mar. 2	8	8	Guildford Cons.	185—195	...	...
54,055	,,	,,	5	5	Do. 5 p.c. Pref.	114—119	...	...
68,250	,,	June 8	5	5	Do. 5 p.c. Deb.	120—125*	...	...
156,600	,,	Feb. 3	7½	7½	Hampton Court Cons. ...	173—178	...	...
81,660	10	Feb 4,'35	5	9	Leatherhead Ord.	16—17	...	...
107,960	10	Mar. 16	4	5½	Mid Kent Ord.	10—11	...	...
230,940	Stk.	Feb. 17	10	10	Oxford & District Ord. ...	210—220	...	...
47,112	,,	,,	5	5	Do. 5 p.c. Pref.	118—123	...	...
50,000	,,	,,	6	6	Do. 6 p.c. Red. Pref. ...	113—118	...	...
126,193	,,	May 18	7½	7½	Peterborough Ord.	157—167	...	...
64,990	,,	Mar. 16	7½	7½	Redditch Ord.	113—118	...	...
166,850	,,	Feb. 17	7	9	Romford Ord.	170—180	...	...
60,000	,,	,,	4	4	Do. 4 p.c. Pref.	97—100	...	...
44,000	,,	Mar. 16	5	5	Do. 5 p.c. Deb.	120—125	...	...
10,950	,,	Mar. 2	8	8	Ryde Ord.	165—170	...	...
136,191	,,	Feb. 3	5	7	Scarborough Ord.	128—138	...	...
27,825	,,	Feb. 3	8	8	Shanklin & Ventnor Cons. ...	152—162	...	...
40,643	,,	Mar. 2	7	7	Slough Ord.	147—152	...	...
221,000	,,	Dec 16	5	5	Do. 5 p.c. Deb.	116—121	...	...
28,872	1	May 4	5½	5½	S. Midland Gas Cpn.Ltd. Ord.	20/—22/-	...	...
28,866	1	Mar. 16	4½	4½	Do. 4½ p.c. Red. Cum Pref.	19/6—21/6	...	...
137,730	Stk.	Feb. 17	7	7	Southgate & Dist. 7 p.c. max.	153—158	...	...
62,500	,,	,,	5	5	Do. 5 p.c. Pref.	115—120	...	...
117,228	,,	Mar. 2	5	6	Swindon Cons.	111—116	...	114½—115
60,425	,,	Dec. 16	5	5	Do. 5 p.c. Deb.	122—127	...	...
50,000	1	Mar. 30	...	5·52d. a	Utd. Kingdom Gas Cpn. Ord.	20/6—22/6	...	21/4½—21/7½
760,910	1	,,	2½	2½	Do. 4½ p.c. Prefd. Ord....	20/—22/-	...	...
110,910	1	May 18	2½	4½	Do. 4½ p.c. Cum. Pref. ...	21/—23/-	...	21/7½
900,000	Stk.	Mar. 16	...	3½	Do. 3½ p.c. Red. Deb. ...	98—101	...	...
130,000	,,	Feb. 3	5	8	Wakefield Ord.	140—145	...	...
81,650	,,	,,	5	5	Do. 5 p.c. max.	105—110	...	...
82,000	,,	Feb. 3	6	6	Weymouth Ord.	106—111	...	...
98,384	,,	Feb. 3	6	6	Wolverhampton 6 p.c. Pref.	127—132	...	...
160,000	,,	June 8	5½	5½	Do. 5½ p.c. Rd. Db	107—112*	...	...
370,000	,,	Feb. 3	4	6	York Cons.	107—112	...	...
90,000	,,	Dec. 16	5	5	Do. 5 p.c. Red. Deb. ...	103—108	...	...
133,640	,,	Feb. 3	6½	6½	Yorktown (Cam.) 5 p.c. Cons.	130—135	...	...
120,000	,,	,,	5	5	Do. 5 p.c. Pref.	115—120	...	...
35,000	,,	Dec. 16	5½	5½	Do. 5½ p.c. Deb.... ...	130—135	...	...

a Actual.

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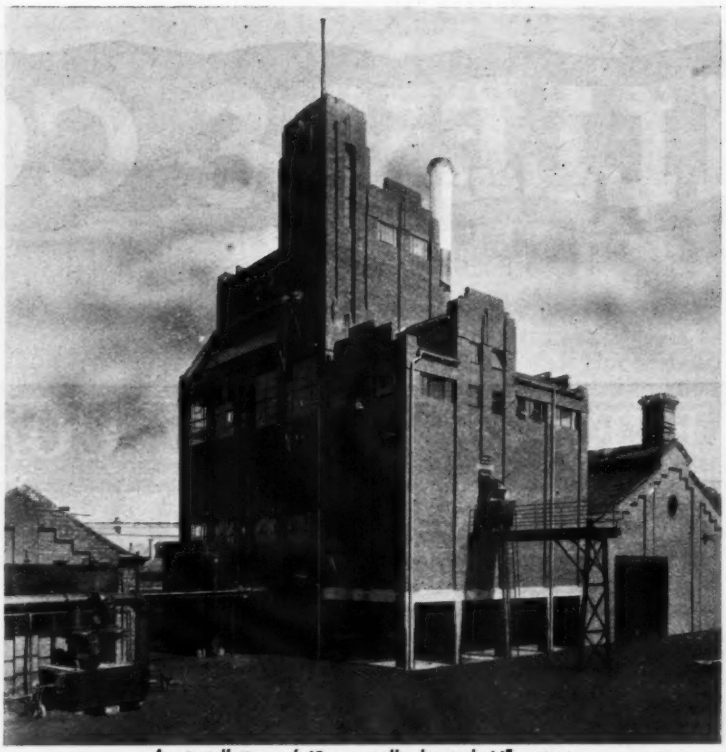

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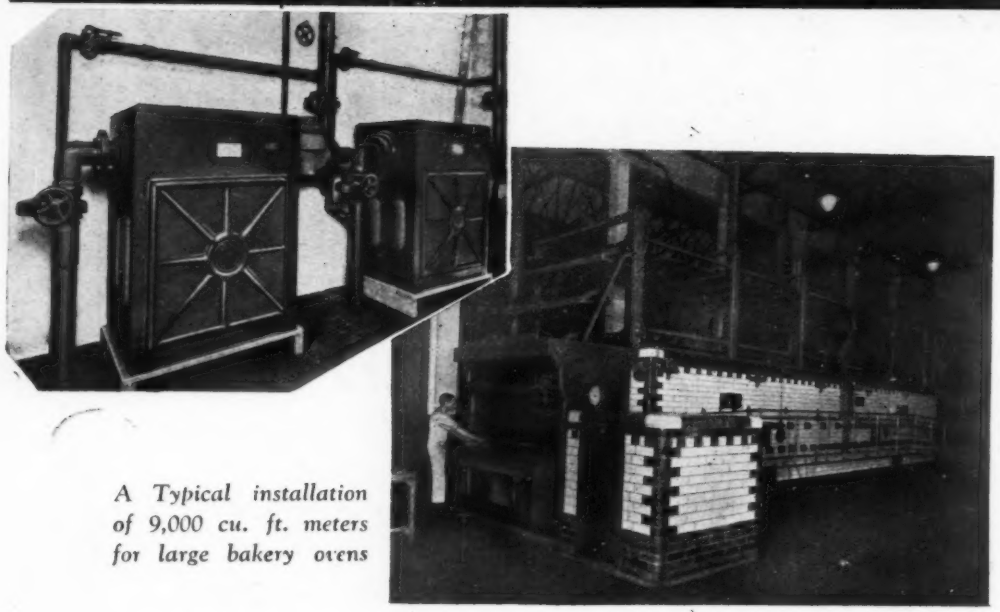

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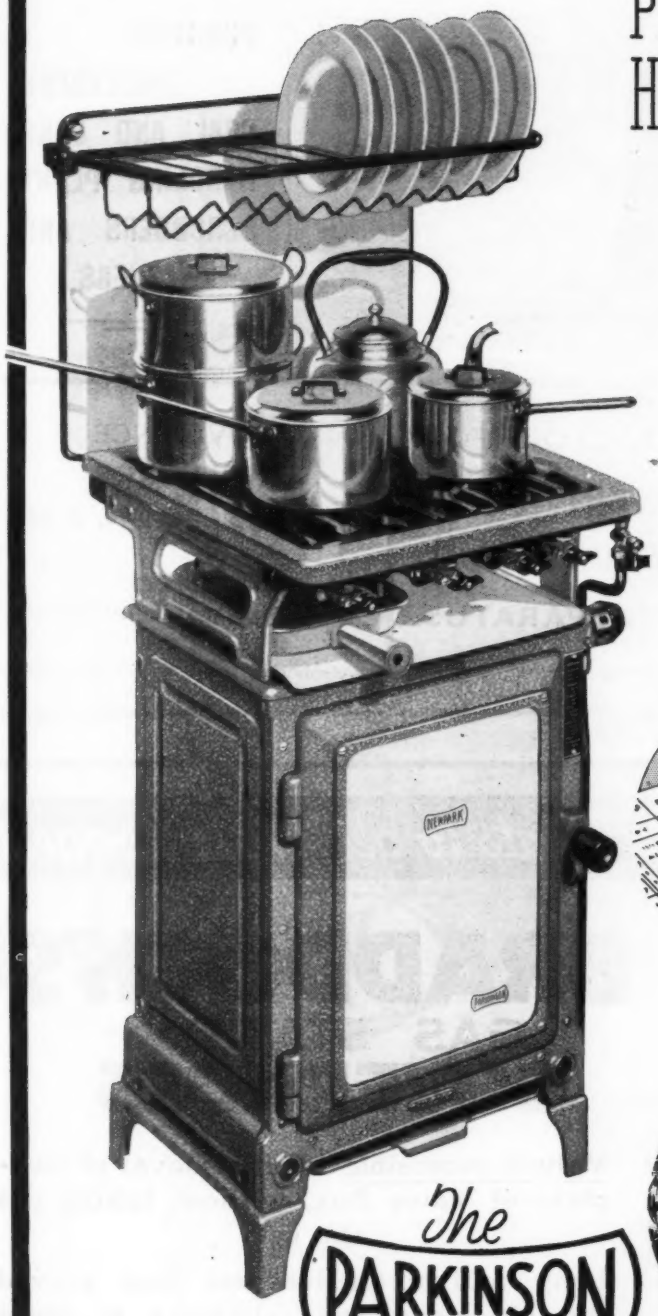

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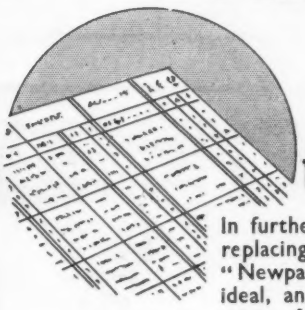

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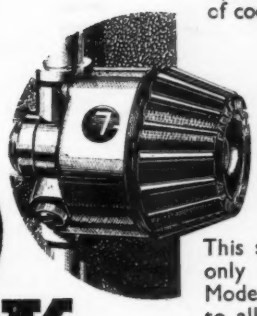

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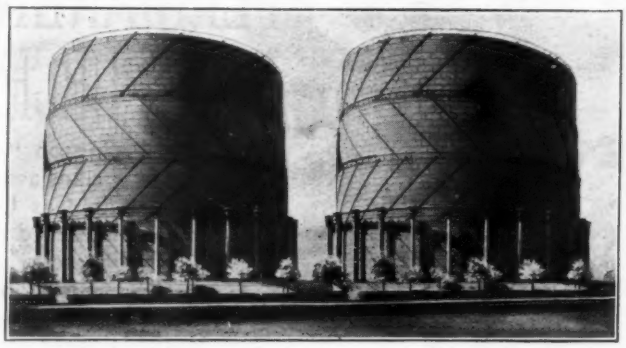

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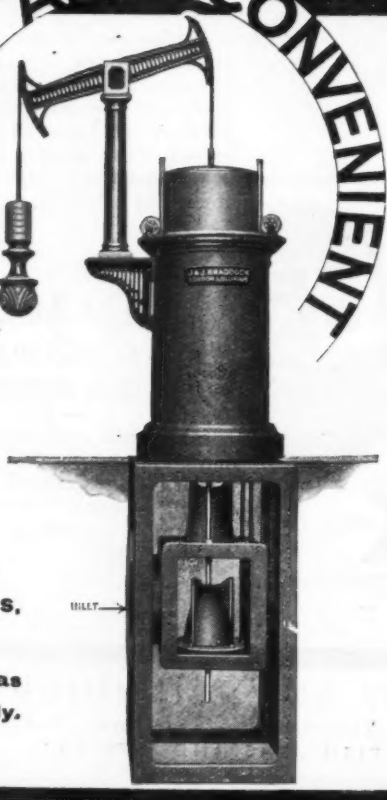

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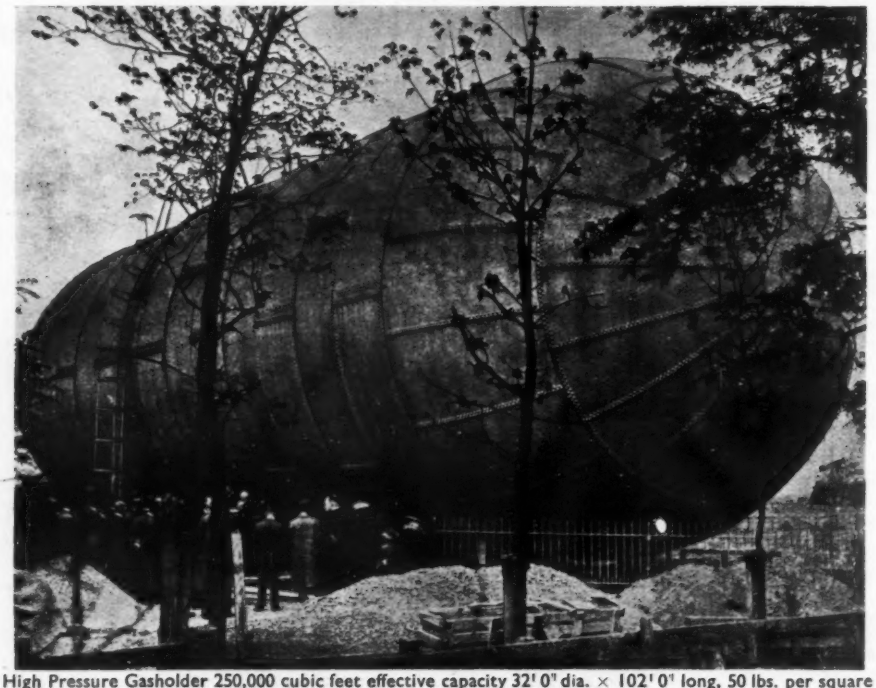

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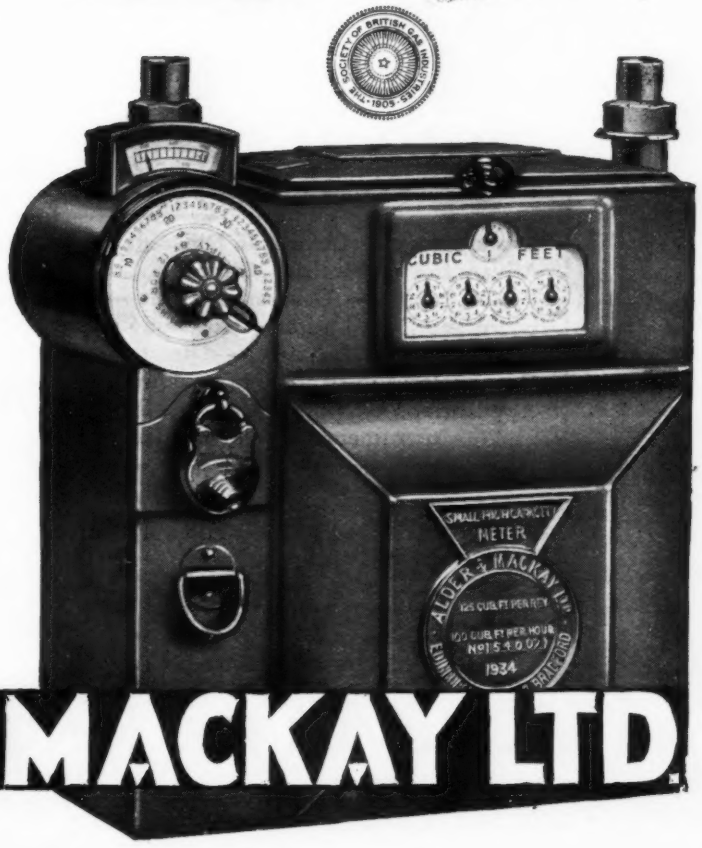

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Tottenham. H. C. SMITH.

Extract from Author's Preface.

". . . . If a work of this description is to be of any real value, it is essential that it should be written in terms which may be readily understood by readers who have neither the time nor the opportunity to acquire specialised electrical knowledge; and I have accordingly done my best to handle the subject in a general manner. . . . The qualified Electrical Consultant has a well-defined place in these matters; but the degree of ultimate success attending the use of electricity on a Gas Undertaking is dependent upon factors which can only be assessed at their true values by Gas Engineers themselves. . . . . "

CONTENTS

Introductory — Claims of Different Power Converters — Characteristic Advantages of Electric Motors — Costs of Gas and Steam — Source of Power Supply — Generating Plant — Selection of Generator — Switchboard and Distribution — Costs of Driving by Steam, Gas, and Electricity — Economical Loading — Direct Current Motors — Motor Control Gear — Position of Motors — Converting Existing Plant — Miscellaneous Applications — Telpherages — Metering Gas by Electricity — Control Instruments — The Human Element — Load Estimates.

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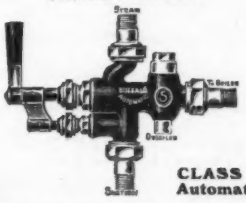

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Particulars may be obtained from Mr. Sydney Francis, A.M.I.Mech.E., Engineer and Manager, Gas and Water Department, Town Hall, Clacton-on-Sea.

Tenders must be delivered to the undersigned at the Town Hall, Clacton-on-Sea, by not later than noon on Wednesday, 1st July, 1936, in a plain sealed envelope, endorsed "Tender for Pipes." Tenders received without such endorsement will not be considered.

The Council do not bind themselves to accept the lowest or any Tender.

GEO. T. LEWIS,
Clerk of the Council.

Town Hall,
Clacton-on-Sea.

CONTRACTS OPEN.
(Continued.)

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No Tender will be received unless enclosed in a plain sealed envelope bearing the words "Contract No. ...., Gas Department," but not bearing any name or mark indicating the sender. Tenders must be sent so as to reach me not later than Ten a.m. on Wednesday, 8th July, 1936.

All Tenders must be made unreservedly as regards the Specification generally and subject to the conditions and stipulations.

Parties tendering do so at their own cost, and must have erected a similar plant of like capacity which can be inspected.

Tenders will only be accepted subject to the approval of the Ministry of Health.

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N. L. FLEMING,
Town Clerk.

Town Hall,
Bradford.

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No Special Forms of Tender are supplied.

The Council reserve to themselves the right to divide the Tenders or to decline any Tender.

Dated this 22nd day of June, 1936.

JAMES BEASLEY,
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NOTICE is Hereby Given that the TRANSFER BOOKS of this Company, so far as they relate to CAPITAL STOCKS, WILL BE CLOSED at Four o'clock p.m. on Wednesday, the 1st day of July next, and will be RE-OPENED on the morning of Saturday, the 1st day of August next.

Dividends payable in respect of the Half-Year ending the 30th inst. will be remitted by Warrant forwarded by post on the 31st August, 1936, to those Proprietors who were the Holders of Capital Stocks when the Transfer Books were closed, or their Authorised Agents.

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June 15, 1936.

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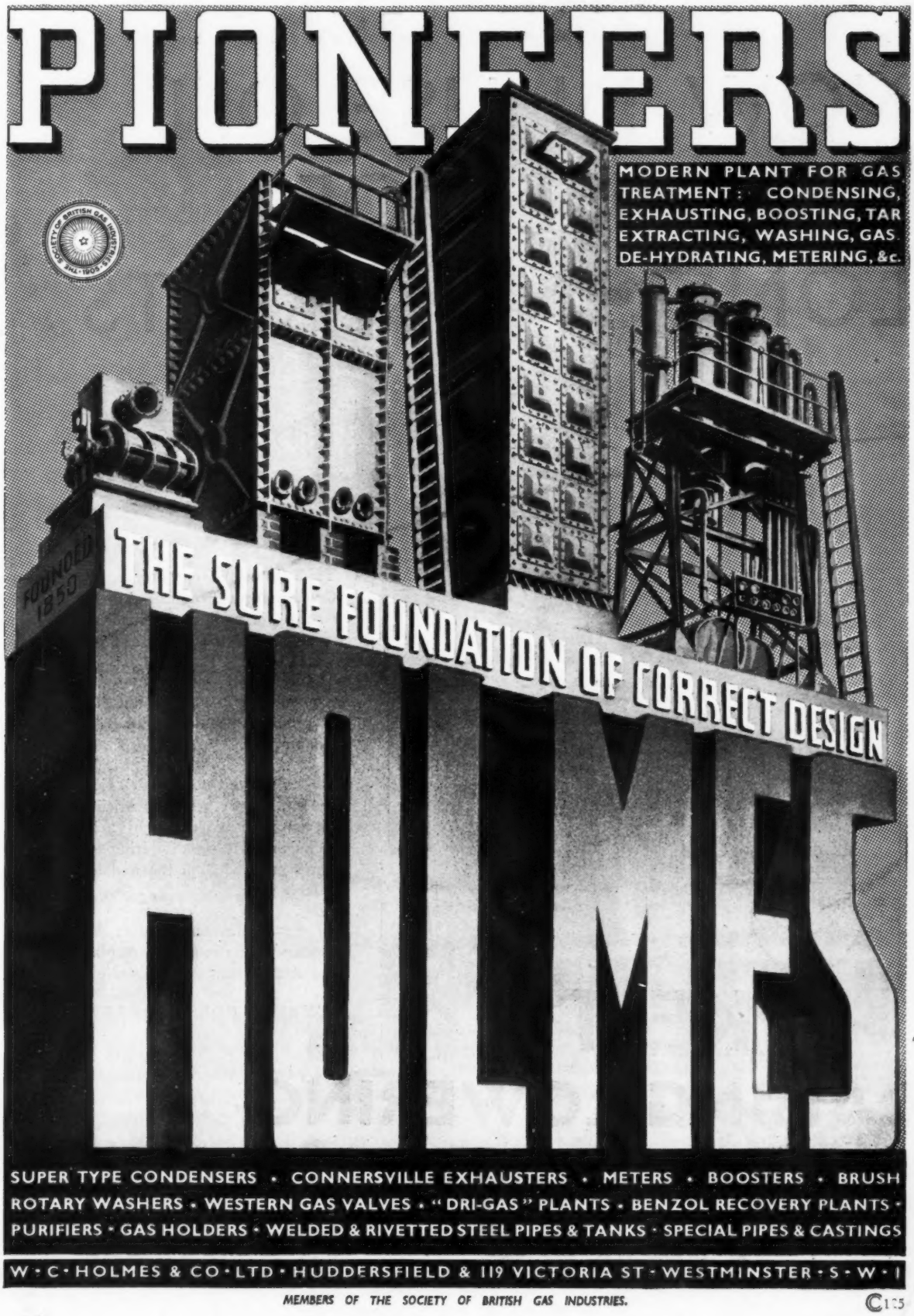
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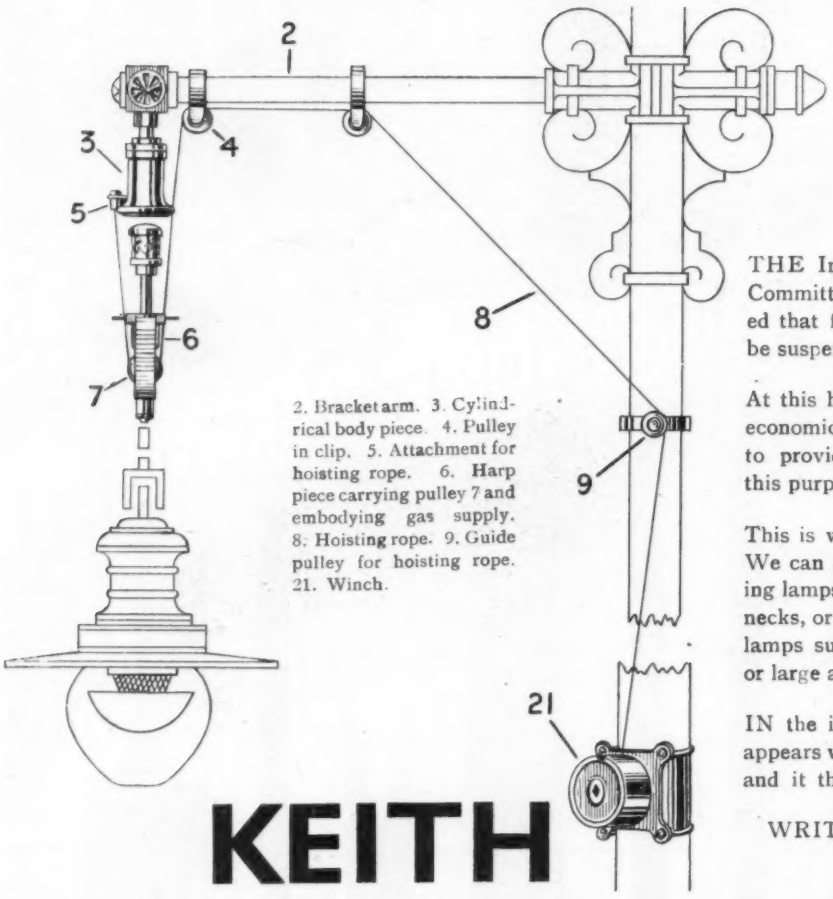

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FEET
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Previous Announcement June 17

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SEE CENTRE PAGE VII.

COWAN'S
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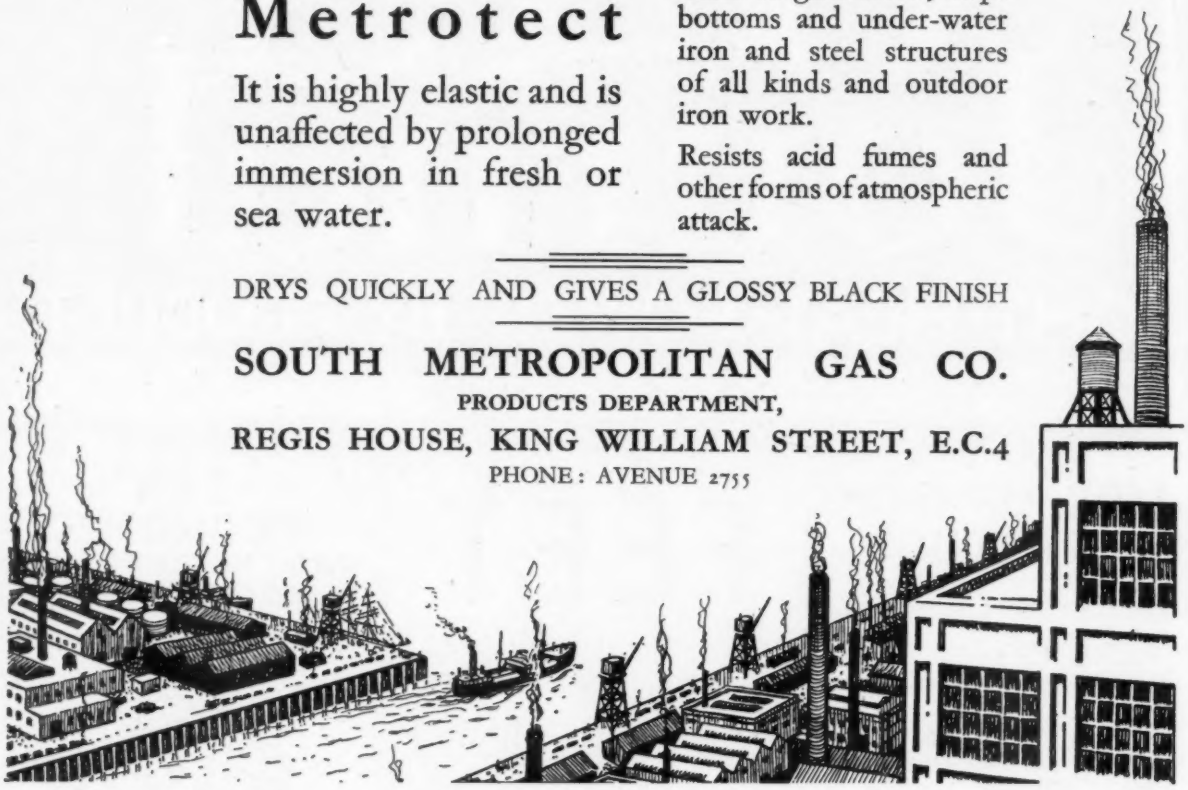

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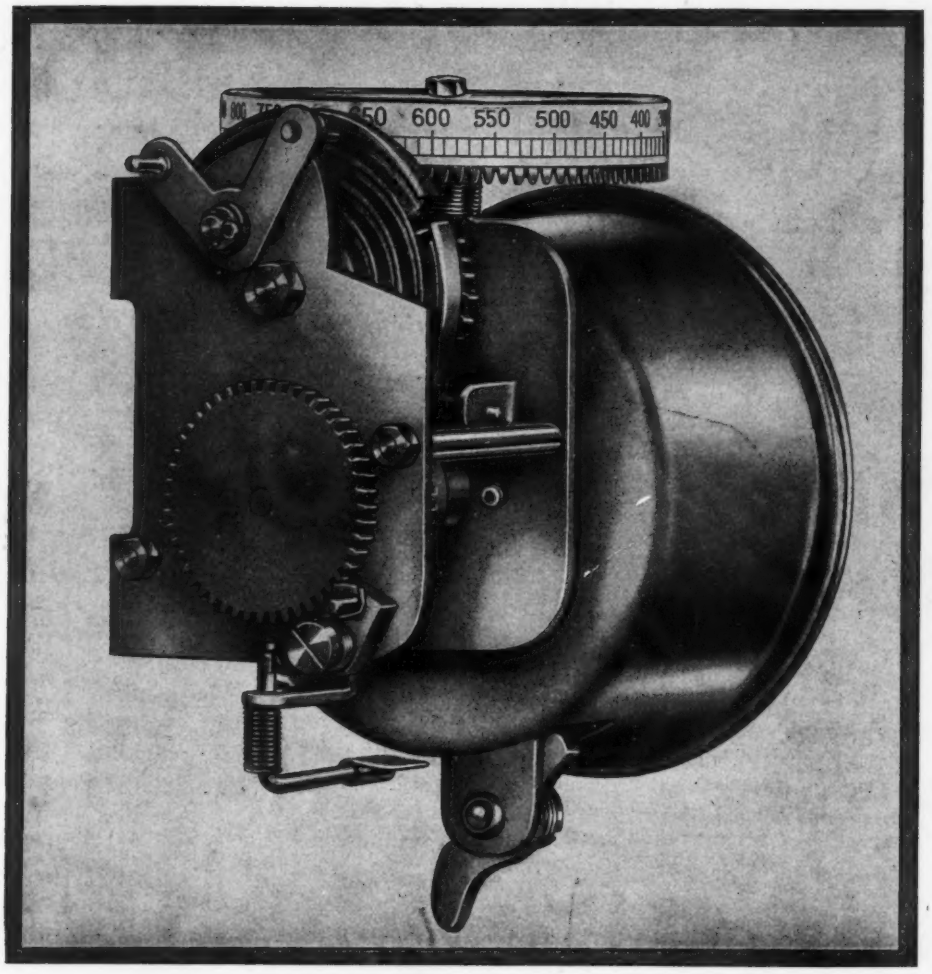

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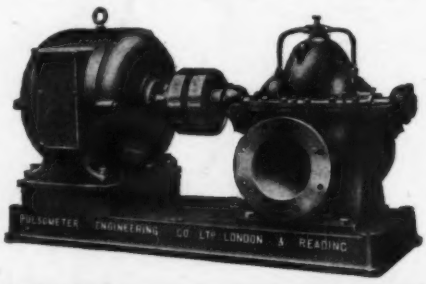

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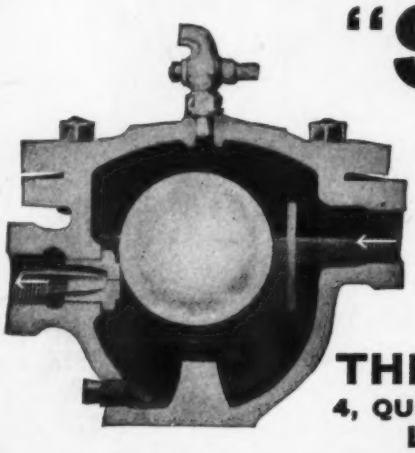

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